TELEPHONY

The Journal of the Telephone Industry

THE JOHN CRERAR
JUL 27 1940
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VOLUME 119

JULY 27, 1940

NUMBER 4

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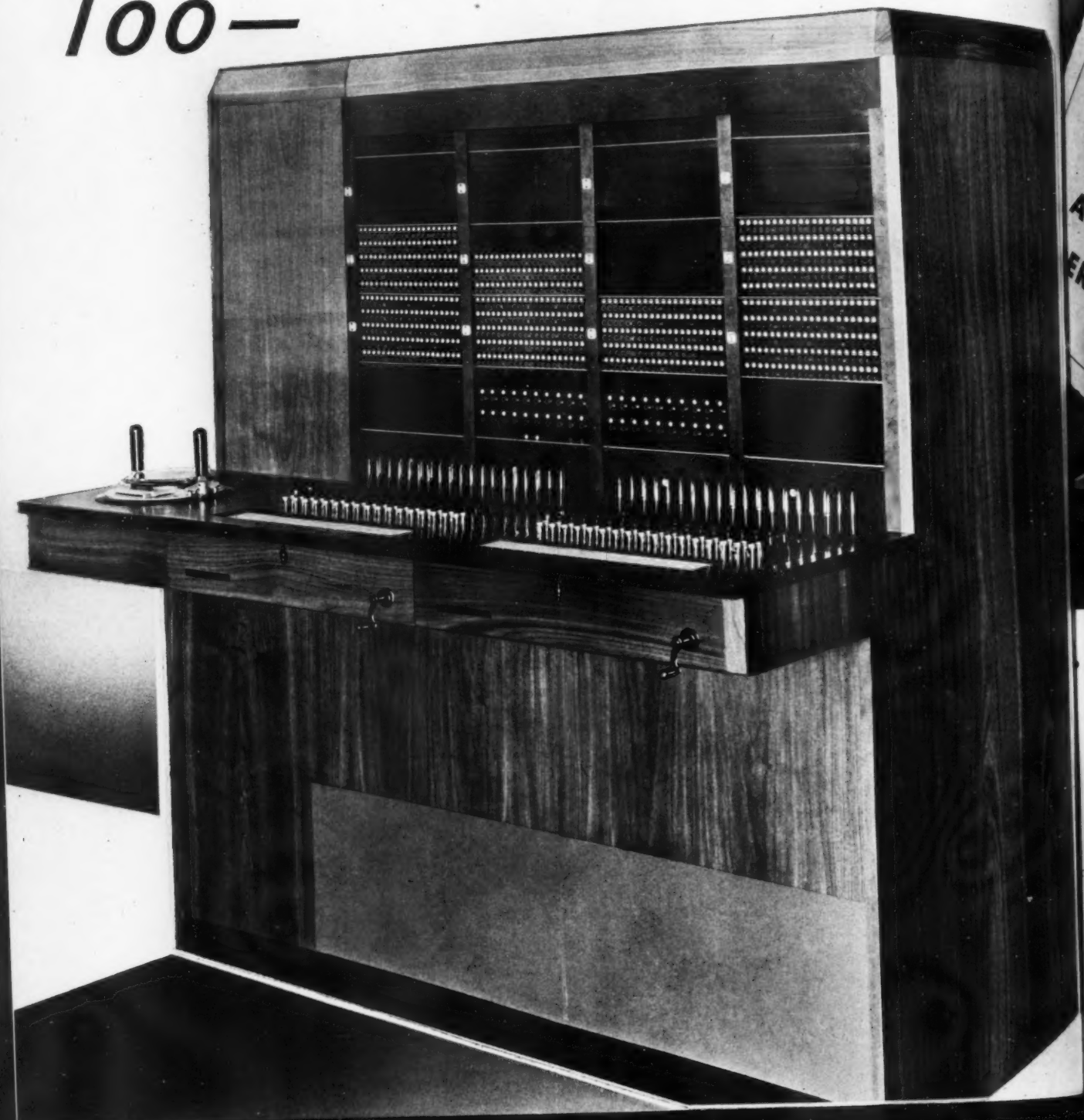

A LEICH SWITCHBOARD

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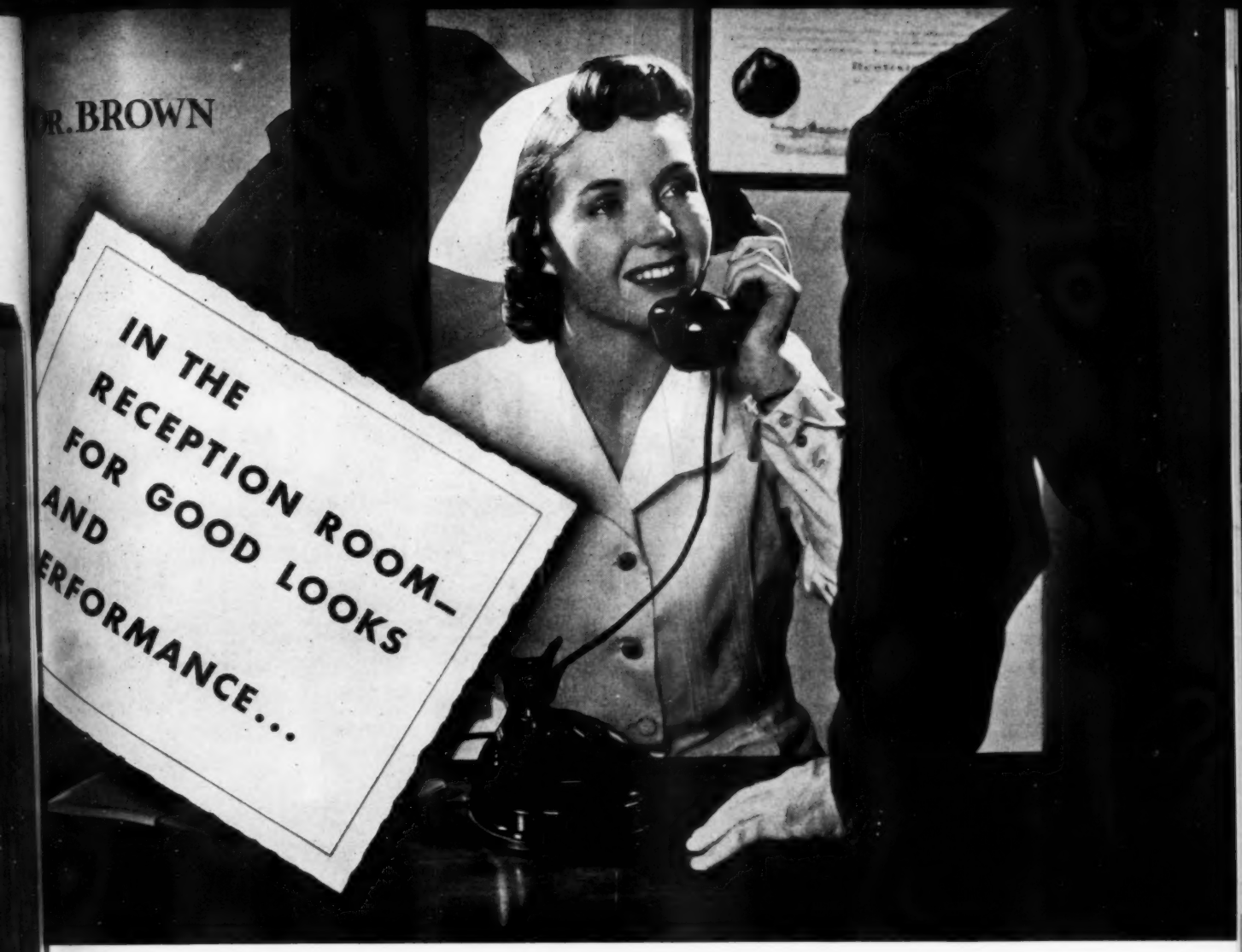

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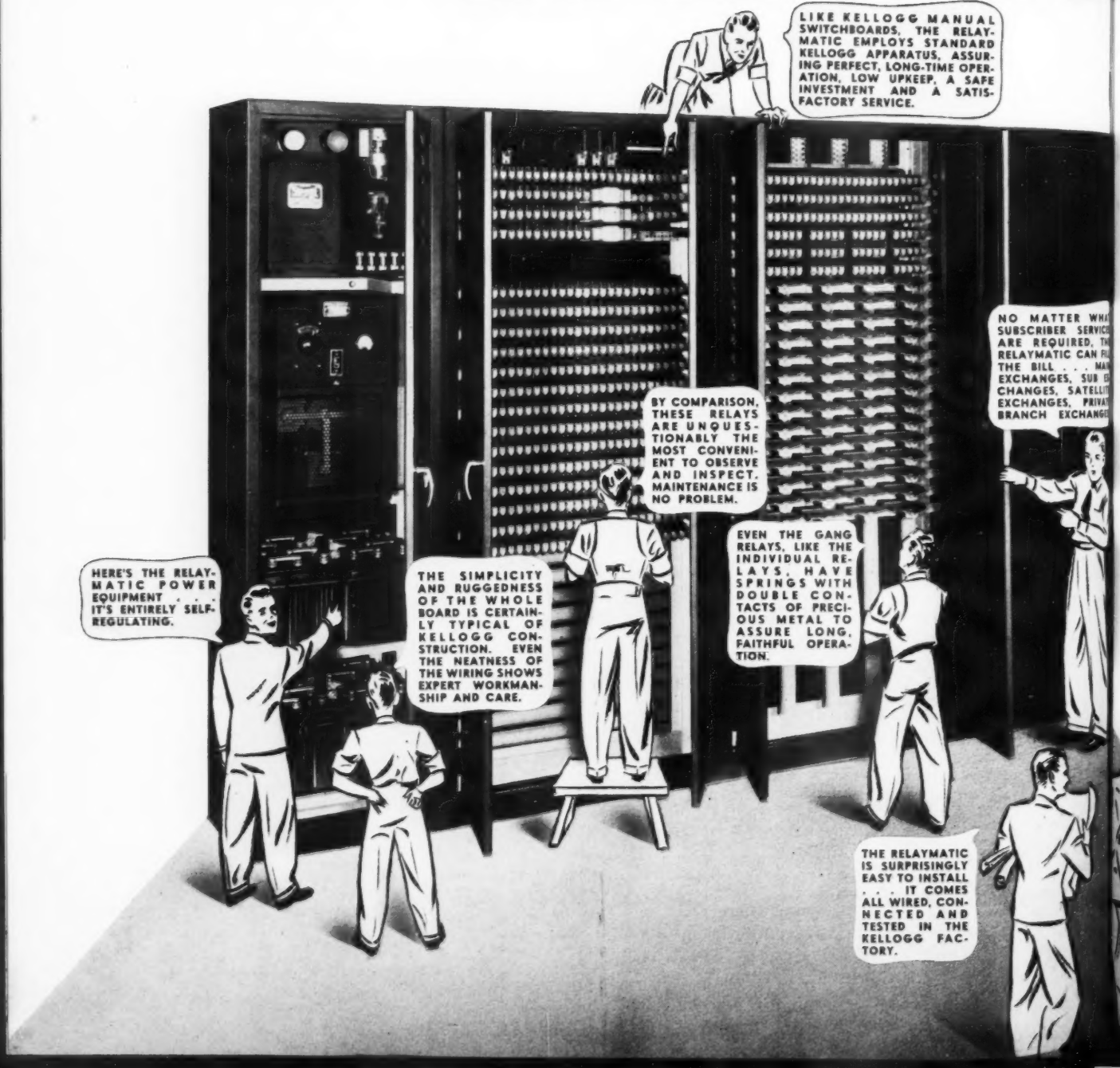
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THE RELAYMATIC IS SURPRISINGLY EASY TO INSTALL . . . IT COMES ALL WIRED, CONNECTED AND TESTED IN THE KELLOGG FACTORY.

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THE HEART OF THE
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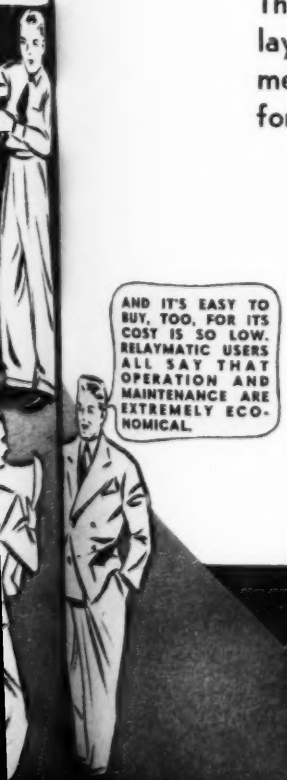
KELLOGG GANG RELAY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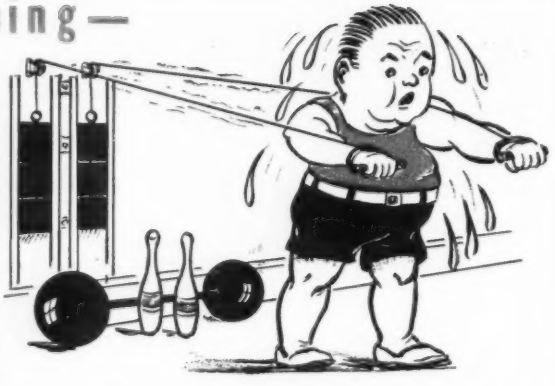

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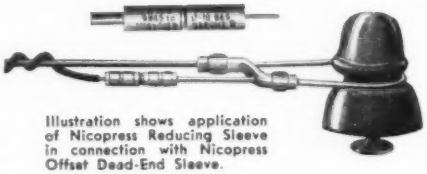

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IN THIS ISSUE

PHOTOGRAPHING TELEPHONE TRAFFIC 9
By Emmett D. Talbot

A BOOKKEEPING SYSTEM FOR SMALL COMPANIES (Concluded)—*By Ward Hinman* ... 15

IN THE NATION'S CAPITAL 17
By Francis X. Welch

BUSY TONGUES 20
By Anne Barnes

NEW IDEAS FOR PLANT AND EXCHANGE—*By Ray Blain* ... 23

HERE AND THERE IN THE FIELD 25

FINANCIAL DATA 27

COMMISSION AND COURT ACTIVITIES 30

"TELEPHONY'S" ENGINEERING DATA—By B. C. Burden 32

Coming Conventions 16
"Telephony's" Index for Volume 118 22

Telephony

The Journal of the Telephone Industry

July 27, 1940

Published by
TELEPHONY PUBLISHING CORP.
608 So. Dearborn Street, CHICAGO
Telephone Wabash 8604

H. D. FARGO . . PRESIDENT AND TREASURER
S. R. EDWARDS . . EDITOR AND SECRETARY
H. D. FARGO, JR. VICE-PRES. AND ADV. MGR.
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Subscription—10 Cents a Copy
$3 a Year U. S., Cuba and Mexico,
$4 Canada, $5 Other Countries

PHOTOGRAPHING TELEPHONE TRAFFIC

By EMMETT D. TALBOT
Consulting Engineer, Rochester, N. Y.

***DETERMINING THE AMOUNT** of traffic of dial offices, in which there was no mechanical means for obtaining such information, proved a puzzling problem until it was decided that it might be possible to photograph the busy lamps. Film records obtained through this unique method supplied the information necessary to determine traffic load and the suitability of the trunks to handle the load*

THE QUANTITIES of central office apparatus required to handle the traffic load are based on the subscribers' average calling rates and holding time. The calling rate and holding time data are determined both for the average day and the average busy-hour. These fundamental data are generally determined as follows:

(1) For manual central offices—

Calling rate, from carefully-taken peg counts.

Holding time, by stop-watch time observations or by peg and plug counts.

(2) For dial central offices—

Calling rate, from traffic peg-count registers associated with groups of subscribers' lines.

Holding time, by stop-watch time observations or from a combination of traffic peg-count registers so arranged that the number of equivalent busy-hour calls on the basis of a definite period of time (100 or 120 seconds) can be read directly from the traffic registers.

It is most essential to have accurate peg-count data (calling rate and holding time) as the basis for calculating the amounts of apparatus required to handle the traffic load in any given central office.

If no reliable peg-count data are available the amounts of central office equipment needed to handle the traffic in a given central office in such cases must be determined by estimating the traffic based on past experience or, as is frequently done, by pure guess. The latter procedure is, of course, a hazardous one to employ, as it may result in providing either too much or too little equipment, which may prove costly to adjust.

A correctly-engineered dial central office equipment will provide sufficient apparatus to handle the average busy-hour load within the limits imposed by the theoretical call-carrying capacities of the trunk groups involved.

The cost of central office equipment frequently expressed on the basis of dollars per line is often misleading, for the cost varies—depending upon the amount of traffic to be handled. The cost per line for central office equipment for a low-calling rate and short-holding-time office will be less than for an office having a high calling rate and holding time. It is, therefore, most important from both a cost and a service standpoint to provide as nearly as possible the correct amount of apparatus.

In a recent survey of traffic in dial central offices MR. TALBOT took many photographs of traffic. These were carefully analyzed. The resultant curves with explanations, as presented in this article, are believed to be the first published data on the distribution of calls at secondary line switches.

If the equipment is under-engineered the cost per line may be satisfactory, but the equipment will be unable to handle the calls satisfactorily from the subscribers' standpoint. Likewise, an over-engineered office will produce an excessive cost per line and will be provided with

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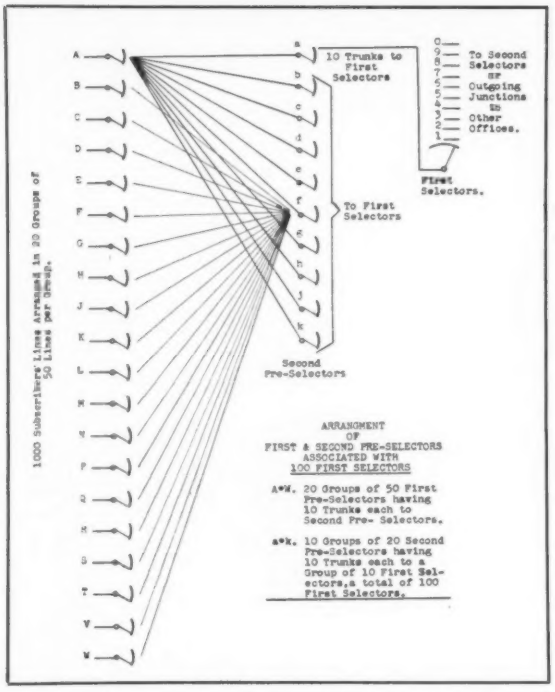
1000 Subscribers' Lines Arranged in 20 Groups of 50 Lines per Group.
10 Trunks to First Selectors
To First Selectors
Second Pre-Selectors
To Second Selectors SF
Outgoing Junctions to Other Offices.
First Selectors.
ARRANGEMENT OF FIRST & SECOND PRE-SELECTORS ASSOCIATED WITH 100 FIRST SELECTORS
A*M. 20 Groups of 50 First Pre-Selectors having 10 Trunks each to Second Pre- Selectors.
a*k. 10 Groups of 20 Second Pre-Selectors having 10 Trunks each to a Group of 10 First Selectors, a total of 100 First Selectors.

Fig. 1 shows how trunks from first pre-selectors are connected at a distributing frame to second pre-selectors.

more equipment than is required to render a satisfactory service.

The modern practice of providing traffic registers in connection with dial central office equipment enables the operating staff to keep a close check on the traffic and, from the peg-count data always available, to adjust the trunk groups as needed to better handle the traffic load. Furthermore, additions to existing offices can be engineered in the most economical manner where reliable traffic data are available.

We are concerned in this discussion with a group of dial offices making up a multi-office network in which there are no electrical or mechanical means provided for determining the amount of traffic being originated by the subscribers. In this case it was necessary to know the number of calls being handled by the equipment for two definite reasons:

(1) To determine the present traffic load and the suitability of the trunks to handle the load.

(2) To permit proper engineering of additions to each of the central offices.

This dial system network is made up of a group of five central offices as follows:

Office Name	Class of Office	Number of Working Lines	Number of Working Stations
Boa Vista	Main	900	1,165
Capunga	Branch	700	823
Olinda	Satellite	100	102
Recife	Main	600	834
Sao Jose	Main	1,000	1,353

All the subscribers' service is on an individual flat-rate basis. The present numbering scheme is laid out for 10,000 subscribers with four-digit numbers. The numbering scheme is as follows:

Present Numbering Scheme, Recife Network

First Selector Levels		Numbers Present Working	Future
0	Unassigned	—	0000-0999
9	Recife	9000-9599	9600-9999
8	Sao Jose	—	8000-8999
7	Sao Jose	—	7000-7999
6	Sao Jose	6000-6999	—
5	Boa Vista	—	5000-5999
4	Boa Vista	—	4000-4999
3	Boa Vista	3000-3099	3100-3899
2	Boa Vista	2000-2799	—
1	Unassigned	—	1000-1999

Capunga takes numbers from Boa Vista, working as a branch office with numbers:

Working 28000-28699
Future 28700-28999 Total 1,000

Olina takes numbers from Boa Vista, working as a satellite office with numbers:

Working 2900-2999
Future 3900-3999 Total 200

The Capunga office is on a five-digit basis, all other offices being on a four-digit basis.

The foregoing numbering scheme and the arrangement of the system network is limited, so it is planned to revamp the system by changing the branch and satellite offices to main offices and to increase the numbering plan by making the network a five-digit area.

The central office equipment is Siemens Brothers, London, England, step-by-step No. 16 type, operating on 60 volts.

The equipment in the main central offices—Boa Vista, Sao Jose and Recife—consists of:

First pre-selectors:
10-point rotary switches, one for each subscriber's line.

Second pre-selectors:
10-point small rotary switches, 10 switches for each group of 50 first pre-selectors, each group of second pre-selectors having access to a group of 10 first selectors.

First selectors.

Local second selectors.

Incoming selectors:

Final selectors:
There are the three usual types of final selectors—
Local finals
P.B.X. (trunk-hunting) finals
Test finals

The equipment in the branch office Capunga consists of:

First and second pre-selectors.

Discriminator repeaters:
The second pre-selectors have access to groups of 10 discriminator repeaters. All inter-office calls are switched at the discriminator repeaters to outgoing junctions to a group of incoming first selectors in the Boa Vista office. Local calls in the Capunga office are switched at the discriminator repeaters to discriminating selectors having trunks to the final selectors.

Incoming third selectors:
Calls to the Capunga office from all other offices are switched at the incoming second selectors in the Boa Vista office to outgoing junctions which terminate at the incoming third selectors in the Capunga office.

There are no direct junctions from the Capunga office to any of the other offices except to the Boa Vista office. All of the inter-office traffic with the Capunga office is routed through the Boa Vista office.

The equipment in the satellite office (Olinda) consists of:

Rotary line switches:
10-point small rotary switches, one switch per line, with trunks from the banks of the rotary line switches to outgoing junction repeaters via outgoing junctions to incoming first selectors in the Boa Vista office.

Outgoing junction repeaters.

Incoming repeaters:
There is a group of incoming junctions from the local second selectors in the Boa Vista office, terminating at incoming repeaters in the Olinda office.

Final selectors:
The incoming repeaters are connected direct to the final selectors.

The arrangement of the first and

second pre-selectors in the main central offices at Boa Vista, Sao Jose and Recife is:

Office	Number of First Pre-Selectors	Number of Second Pre-Selectors	Number of First Selectors
Boa Vista	900	180	90
Sao Jose	1,000	200	100
Recife	600	140	70

The first pre-selectors are mounted on shelves accommodating 20 switches, the shelves being mounted on a vertical framework. Each group of 50 pre-selectors—two groups for each group of 100 subscribers' lines—have 10 trunks multipled to the 50-line first pre-selector group, the ten trunks terminating at the second pre-selectors.

The first and second pre-selectors are arranged according to the well-known primary-secondary line switch scheme. This arrangement permits a group of subscribers' lines access through the second pre-selectors, to a group of up to 100 first selectors. In engineering the equipment according to the accepted theory of the primary-secondary scheme, the practice has been to assume that a group of 100 first selectors will satisfactorily handle a traffic load equivalent to the traffic load that 85 trunks or selectors will handle. In other words, a group of 100 first selectors in this arrangement is assumed to be only 85 per cent efficient.

The trunks from the first pre-selectors are connected at a distributing frame to the second pre-selectors, generally as shown in Fig. 1. The specific arrangement of the connections of the trunks from the first pre-selectors to the second pre-selectors in this network are shown in Figs. 2 to 5.

The second pre-selectors are mounted on shelves holding 10 switches each, and the shelves are mounted on a vertical framework having space for 10 shelves. The framework for a complete group of second pre-selectors consists of:

Shelf A, lowest mounting space on the vertical framework, two shelves of 10 switches each, a total of 20 pre-selectors; the 20 pre-selectors on shelf A have access to 10 first selectors.

Shelf B, second high on the framework, etc., to

Shelf K, tenth shelf — top of the framework.

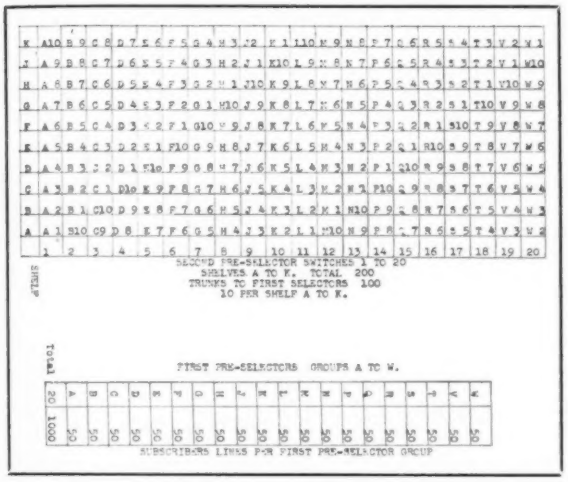
SECOND PRE-SELECTOR SWITCHES 1 TO 20
SHELVES A TO K. TOTAL 200
TRUNKS TO FIRST SELECTORS 100
10 PER SHELF A TO K.
FIRST PRE-SELECTORS GROUPS A TO W.
SUBSCRIBERS LINES PER FIRST PRE-SELECTOR GROUP

Fig. 2. Arrangement in Sao Jose central office of second pre-selector switches associated with first pre-selector trunks. Line groups A to W.

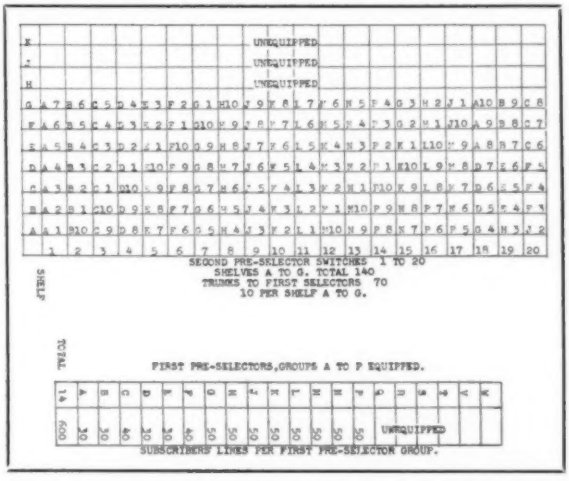
UNEQUIPPED
UNEQUIPPED
UNEQUIPPED
SECOND PRE-SELECTOR SWITCHES 1 TO 20
SHELVES A TO G. TOTAL 140
TRUNKS TO FIRST SELECTORS 70
10 PER SHELF A TO G.
FIRST PRE-SELECTORS, GROUPS A TO P EQUIPPED.
UNEQUIPPED
SUBSCRIBERS LINES PER FIRST PRE-SELECTOR GROUP.

Fig. 3. Arrangement in Recife central office of second pre-selector switches associated with first pre-selector trunks. Line groups A to P.

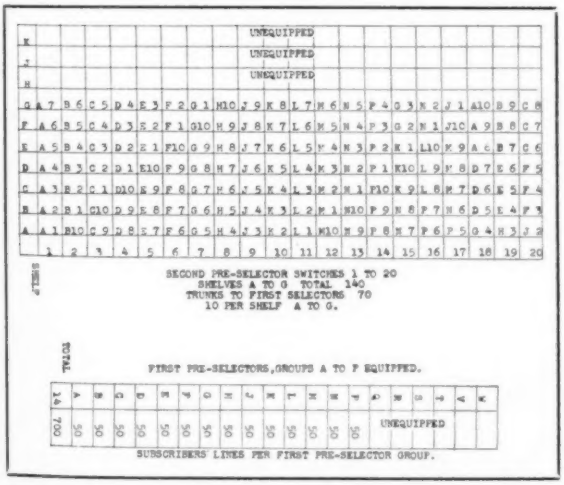
UNEQUIPPED
UNEQUIPPED
UNEQUIPPED
SECOND PRE-SELECTOR SWITCHES 1 TO 20
SHELVES A TO G. TOTAL 140
TRUNKS TO FIRST SELECTORS 70
10 PER SHELF A TO G.
FIRST PRE-SELECTORS, GROUPS A TO F EQUIPPED.
UNEQUIPPED
SUBSCRIBERS LINES PER FIRST PRE-SELECTOR GROUP.

Fig. 4. Arrangement in Capunga central office of second pre-selector switches associated with first pre-selector trunks. Line groups A to P.

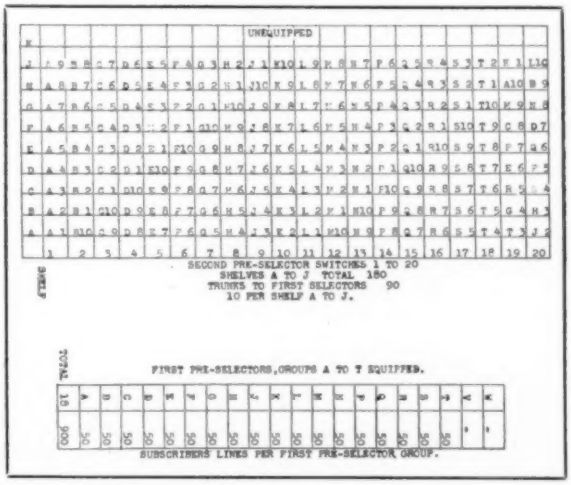
UNEQUIPPED
SECOND PRE-SELECTOR SWITCHES 1 TO 20
SHELVES A TO J TOTAL 180
TRUNKS TO FIRST SELECTORS 90
10 PER SHELF A TO J.
FIRST PRE-SELECTORS, GROUPS A TO T EQUIPPED.
SUBSCRIBERS LINES PER FIRST PRE-SELECTOR GROUP.

Fig. 5. Arrangement in Boa Vista central office of second pre-selector switches associated with first pre-selector trunks. Line groups A to T.

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Through the central portion of the vertical framework the control and signal apparatus is mounted. Associated with each second pre-selector rotary line switch is a busy lamp. This lamp is mounted at the top of the switch arc immediately above the rotary switch position number plate. The number plate, which is made of a white plastic, is numbered for each trunk position 1 to 10 and it rotates with the switch.

This number plate enables the switchman to readily determine the number of the first selector engaged by a busy second pre-selector. The number plate is mentioned specifically as it bore an important part in the photographing of the traffic.

The method of cross-connecting the trunks from the first pre-selectors and the second pre-selectors, shown in Figs. 2 to 5, is as follows:

Referring to Fig. 2 for the Sao Jose office, this office is equipped with 1,000 subscribers' lines, 200 second pre-selectors and 100 first selectors, a full primary-secondary group. The 1,000 subscribers' lines are divided into 20 groups of 50 lines each, designated as groups A to W as shown. The 10 trunks from group A to the second pre-selectors are connected as follows:

Trunk 1 to the first switch of the second pre-selector group, shelf A.

Trunk 2 to the first switch, shelf B, and so on. . . .

Trunk 10 being connected to the first switch, shelf K.

With this arrangement the traffic originated by primary group A is theoretically evenly distributed over the entire 100 first selectors; that is, all calls over trunk 1 of group A will be handled by the first 10 selectors serving the second pre-selector group, shelf A; trunk 2 to shelf B, etc. (see Fig. 1).

This cross-connecting scheme is followed out in connecting group B with this difference: In progressing from group A to K inclusive, there is a backward slip of one in the trunk-connecting arrangement. That is, for group B trunk 10 is connected to the second switch of the second pre-selector group, shelf A; and then, in order, follow trunks 1 to 9. For group C the ninth trunk is connected to the third switch of the second pre-selector group shelf A, followed by trunk 10 and then in order, trunks 1 to 8. With group L the trunks are again connected in order 1 to 10 as in group A, and then slipped one trunk in each group M to W.

In those offices in which there are less than a full group of second pre-selectors (200), the standard cross-connecting is altered. This alteration is known as temporary fanning; for example, refer to Fig. 3, the cross-connecting scheme for the Recife office. In this office there are 600 subscribers' lines but, due to the class of subscribers served, the calling rate and the holding time is such that in some cases 50 lines in a first pre-selector group produce a traffic load greater than the carrying capacity of 10 trunks under the service conditions desired.

In order to take care of this condition the 600 subscribers' lines were divided into 14 groups as follows:

Group	Number of Lines
A	30
B	30
C	40
D	30
E	30
F	40
G to P	50 each
Total 14	600

The 14 groups have 10 trunks each from the first pre-selectors to the second pre-selectors, a total of 140 trunks.

In this case the first seven trunks from the first pre-selectors, group A, are connected respectively to the first switch of the second pre-selectors, shelves A to G inclusive, the remaining three trunks of the A group being connected as follows:

Trunk	To
8	Switch 18, shelf E
9	Switch 18, shelf F
10	Switch 18, shelf G

In the full group arrangement the trunks from any one first pre-selector group are connected one trunk to each of the 10 first selector groups, whereas in the case of a partial group there are two trunks from each first pre-selector group connected to each of the seven first selector groups. The cross-connecting scheme for the Capunga and Boa Vista offices is shown in Figs. 4 and 5, respectively.

There were two major problems involved in connection with this dial network study:

(1) It was necessary to determine the suitability of the equipment provided in each central office to handle the traffic load on a satisfactory service basis, or whether there was a surplus of equipment beyond the first pre-selectors which would permit more traffic to be handled than was being produced by the number of lines in service.

(2) Determine the traffic bases (calling rate and holding time) that should be used in calculating the amounts of equipment for future line additions to all of the central offices. The central offices were not equipped with traffic registers, nor was it possible to obtain them in the country for temporary use in obtaining the necessary traffic data.

A number of schemes were tried out in an attempt to count the number of calls originated by the line groups, but they were not successful. It was observed, however, that by standing in front of the second pre-selector frame with the busy-lamp switch operated, the busy second pre-selectors could be counted. An attempt was made to count them manually, but the results were most unsatisfactory. It was then decided that it might be possible to photograph the busy lamps and to count the simultaneous connections from the photographic negatives.

Several kinds of cameras having different lens equipment were tried, and it was finally decided to take a series of photographs at one minute intervals during the busy hour in each office. The photographs were taken with a Zeiss Trona camera 9x12 cm., equipped with a Zeiss Tessar F/3.5 lens. The film used was Eastman Kodak Super XX Panchromatic film packs containing 12 exposures. This required five film packs and two film pack holders for taking 60 exposures, one each minute during the busy hour. The busy hour was determined by watching the traffic over a period of several days, and was found to occur at approximately from 9:30 to 10:30 a.m.

The camera was set up about 15 feet from the secondary pre-selector switch rack and focused so that the image of the second pre-selector frame covered the 9x12 cm. film. An exposure of 1/50 second at f-3.5 was given, the switch room having been darkened before the exposures were made. The first results were not satisfactory, the principal trouble

FRONT COVER

A construction crew of the Pacific Telephone & Telegraph Co., shown on the front cover, is setting a pole near Point San Pedro a few miles south of San Francisco, Calif. In the background is the rugged, mountainous shore line where the Pacific Ocean rolls against the land.

Many telephone companies throughout the United States are planning and carrying on construction and maintenance work to insure that telephone service will continue to be satisfactory to subscribers. All telephone people take pride in the slogan that "The message must go through"—and plant men and operators take equal importance in fulfilling this aim.

Fig. 6. Photographic record of simultaneous calls in Sao Jose office, April 6, 1939, 10:07 A.M. Total, 68 calls.

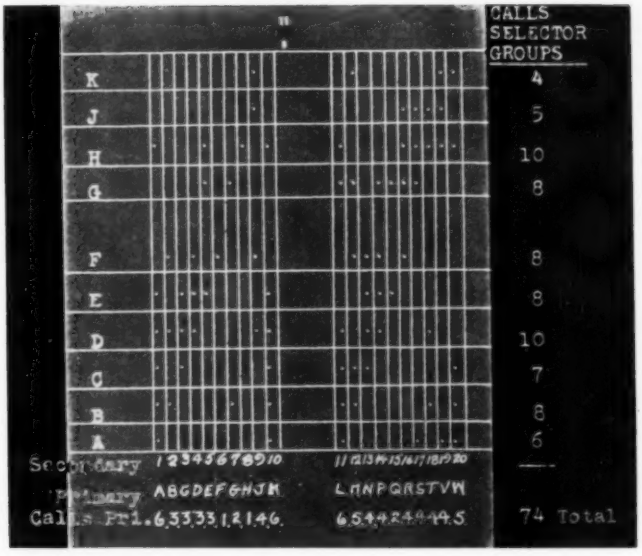

Fig. 7. Photographic record of simultaneous calls in Sao Jose office, April 5, 1939, 10:33 A.M. Total first selectors busy, 74.

being that there was a double set of lamp images. These double images were found to be caused by the lighted busy lamp being reflected in the white switch number plate. The number plates were removed and a new set of exposures made, which were found to be entirely satisfactory.

Each film in a pack is numbered, so that it was only necessary to devise some method for identifying each of the film packs. This was done by the use of a small box having a two-inch square opening in one side of the box, so arranged that cards could be slid in front of the opening. These cards were cut out so that the numbers 1 to 5 and Roman numerals I to IV could be combined as required to indicate the film pack number and the central office number.

The box was equipped with a 50-watt lamp, the light from which, shining through the cut-out numbers, would be photographed. This provided a means for identifying the film pack as to office and its sequence in the set of five packs. As soon as one set of 60 exposed films was developed, each film of the set was notched on the edge—each in a different location. This notching was used to identify the date on which the film was made.

A facsimile of one of the exposed film records is shown as Fig. 6. This record was made at 10:07 a.m., April 6, 1939. At this time there were 68 busy second pre-selectors, or 68 per cent of the 100 first selectors occupied. Fig. 7 is a facsimile of a film record taken at 10:33 a.m., April 5, 1939. This record film is superimposed on horizontal and vertical lines that were used to facilitate the counting and identification of the busy switches.

These film records furnished information not only as to the number of busy primary-secondary trunks at each one-minute interval of the recorded hour, but also data pertaining to each group of 50 subscribers' lines. For example, in Fig. 7 the first vertical column corresponds to vertical 1, Fig. 2, and represents the 10 trunks from primary group A. At this instant trunks 1 to 5 inclusive and 8 were busy, while in group B there were only 3 trunks busy. The horizontal rows correspond to the second pre-selector shelves A to K, each of which is served by ten first selectors.

It should be noted at this time, 10:33 a.m., that the 10 selectors serving shelves D and H were all busy. Shelf D had busy trunks from line groups A, B, C, D, J, K, L, N, P to T. At this time and as long as these 10 trunks remain busy, no calls can be received in this second preselector group D, from line switch groups E, F, G, H, M, Q, R, S, V and W. At this time and as long as these 10 trunks remain busy, no calls can be received from line groups B, C, D, F, G, J, M, N, P and Q.

Therefore, at this instant, line groups B, C, D, E, H, J, N, P, R, S, V and W have their quota of 10 trunks reduced to 9 trunks, while line groups F, G, M and Q have their quota of 10 reduced to 8. Inasmuch, however, that there was only one busy trunk in group F, 2 busy in group G, 3 in group M and 5 in group Q, at this instant there still remain sufficient trunks available to handle the expected traffic from these groups.

However, the record made at 10:34 a.m. still shows 74 busy first selectors, but not the same 74 selectors that were busy at 10:33. Now at 10:34 there is no shelf having all 10 first selectors busy; D now has 8 busy and H, 9. During this minute of elapsed time, the busy trunks from line groups C, D, P and T to shelf D have released while the trunks from line groups F and W have become busy. Likewise, in shelf group H the trunks from line groups A, V and W have released and trunks from line groups F and P have become busy.

A detailed analysis of the photographic records gave the trunk load data for which the records were originally made. In addition, the photographic data were tabulated in such a way that it was possible to make a frequency distribution of the number of simultaneous calls in existence for each subgroup of 50 lines (one first pre-selector group).

For example, in the Sao Jose office April 5, 1939, out of the 60 minute-by-minute observations, 3 showed 0 calls on the A first pre-selector, 7 showed 1, 12 showed 2, 15 showed 3, 10 showed 4, 8 showed 5, 3 showed 6, and 2 showed 7. This particular first pre-selector group had an aver-

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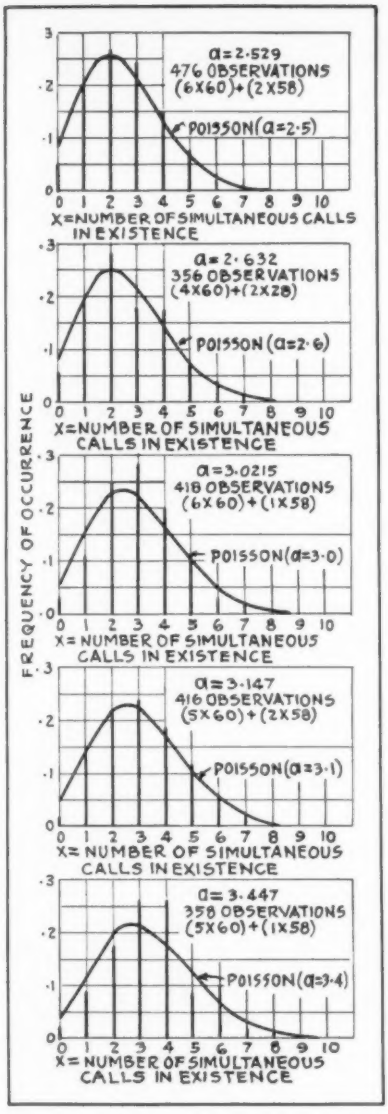

Fig. 8. First pre-selectors. Probability of finding "x" calls in existence at any instant when on the average there are "a" calls in existence. Data from first pre-selector groups having approximately same average. Theoretical probability given by Poisson formula

$$\frac{a^x e^{-a}}{x\,!}$$

age of 3.133 calls simultaneously in existence.

Observations on groups with approximately the same averages were next combined to "smooth" the frequency distributions. Five such load-groupings are shown in Fig. 8. In the first group, for instance, the results of 476 observations are presented. These include 60 minute-by-minute observations on six pre-selector groups and 58 minute-by-minute observations on two other first pre-selector groups, each of which showed an average of approximately 2.5 simultaneous calls in existence.

For assembling these data groups, any hour's minute-by-minute observations on a first pre-selector group in any of the several offices tested which fell at this load level, were considered eligible. Hence, the eight hours' data in Fig. 8 may have come from different offices at the same or at different times of day.

Since most of the subscribers were presumably operating as wholly independent sources, we should expect the frequency distributions of simultaneous calls to follow rather closely the well-known Poisson Law,

$$\frac{a^x e^{-a}}{x\,!},$$

which gives the probability of an event happening exactly "x" times when, on an average, it happens "a" times. On each of the five observed frequency distributions, the theoretical Poisson curve with a corresponding average have been superposed. It is readily seen that the "fit" of the theory to the observation seems quite satisfactory.

By virtue of the unique method of recording the data, it has been possible also to construct frequency distributions of the calls as they fell on the second pre-selectors. Since these switch groups are not independent as were the first pre-selector groups, the observations were assembled by hours for each particular exchange. Five such hours are shown in Fig. 9. It is believed that relatively little data have been published on the distributions of calls at this stage in a machine-switching system.

Attention may be called to the marked difference in shape between the distributions of calls on the first and second pre-selectors. For a given average load, the distributions on the second pre-selectors are materially narrower than on the first pre-selectors, which indicates the advantageous smoothing of traffic that results from a primary-secondary arrangement of switches.

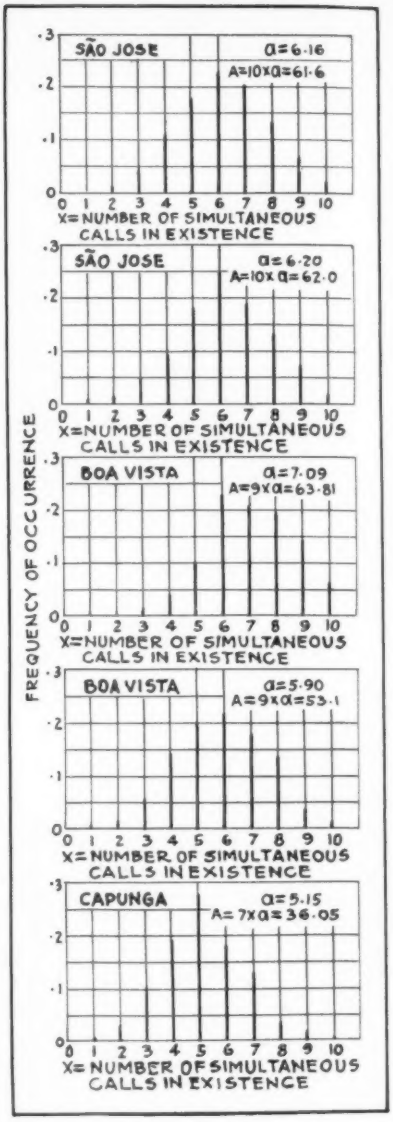

Fig. 9. Second pre-selectors. Probability of finding "x" calls in existence when on the average there are "a" calls in existence.

Station Gain Proves Commerce, Texas, Not Misnamed

Roy Cornish, manager of the Gulf States Telephone Co., Commerce, Texas, announced June 21 that Commerce has—for the first time in history—more than 1,000 telephones. The exchange has been attempting to reach the 1,000-mark for several years, Mr. Cornish said.

In 1929, there were 964 telephones in Commerce—an all-time high up to that year. In 1933, however, the number of telephones fell to an extreme low. Since then, the exchange has made a "comeback" and the 1929 record was equalled several months ago.

Commerce is the first city in the 22-town area served by the Gulf States Telephone Co. to reach the 1,000-mark.

Missouri Convention Set for November 18-19

The annual convention of the Missouri Telephone Association will be held Monday and Tuesday, November 18 and 19, at the Muehlebach Hotel, Kansas City, announces Secretary R. W. Hedrick, of Jefferson City.

A BOOKKEEPING SYSTEM

for Small Companies

By **WARD E. HINMAN**
Chief Telephone Engineer, New York Public Service Commission, Albany

DESCRIPTION OF simplified bookkeeping system, begun in last week's issue, is concluded this week with the Weekly Labor Report, Operating Revenues Summary, and the Salary and Wages Form. (Address at New York State convention)

The Weekly Labor Report is used only by employes who are engaged entirely or partly in the maintenance or construction of telephone plant. Each such employe shall fill in each day the distribution of his time for the day and turn in the report to the office at the end of the week. Directions for the distribution of time are set forth in the following:

The office will summarize the hours in each column and multiply the hours devoted to each class of work by the hourly rate, entering such amounts in the last line of the form. The total of these amounts, entered in the space in the lower right-hand corner, will be the employe's weekly wage.

Weekly Labor Reports should be placed in a binder provided for that purpose and kept as a permanent record. Following are directions for the distribution of time on the Weekly Labor Reports:

In Column Headed—	Enter Hours Devoted to—
Maintenance Labor	Repairing and maintaining all classes of telephone plant and equipment.
Station, Removals & Changes	Removing or changing the location of station equipment, inside wiring and drop wires; also reconnecting "left-in" stations and connecting telephones to existing inside wires.
Central Office Equipment	Installing switchboards, distributing frames, central-office protectors, ringing apparatus, power equipment, central-office cabling and cross-connecting wires, including additions to existing central-office equipment.
Station Wiring	Installing station equipment, inside wiring and drop wires.
Poles, Wire and Cable	Placing poles, guys, crossarms, brackets, wire (except inside and drop wires), ring run, cable including messenger and terminals and conduit.
Plant Removal Labor	Removing retired plant and equipment (except station equipment and inside and drop wires).
Office Salaries	Management of company, keeping books and preparing bills.

Plant Installed and Retired Report

The record of plant installed and retired on the reverse side of the Weekly Labor Report is for the dual purpose of revising the annual state special franchise tax report and of preparing the plant retirement entry for the Disbursement Ledger.

In the Outside Plant Installed and Outside Plant Retired spaces, record

WEEKLY LABOR REPORT

Name _____ Ticket No. _____

Week ending _____ Hourly Rate _____

	Maintenance Labor	Station Removals & Changes	Telephone Plant			Plant Removal Labor	Office Salaries	Totals
			Central Office Equip.	Station Wiring	Poles Wire & Cable			
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Total Hours								
Amount								

OUTSIDE PLANT INSTALLED

Plant Units	TD	TD	TD	TD
Poles				
Iron Wire				
Copper Wire				
Tw.Pr. Wire				
Cable				

OUTSIDE PLANT RETIRED

Plant Units	TD	TD	TD	TD
Poles				
Iron Wire				
Copper Wire				
Tw.Pr. Wire				
Cable				

REUSABLE RETIRED OUTSIDE PLANT MATERIAL

Poles	Iron Wire	Cop.Wire	TwPr Wire	Cable

EQUIPMENT, INSTALLATIONS AND DROP WIRES JUNKED

Telephones (complete)	Desk or HandSet	Desk Set Boxes	Install. Removed	DropWires Removed

Other Plant and Equipment Changes _____

ABOVE is sample of suggested "Weekly Labor Report," pocket size, on face of which plant employes should record the division of their time for various work. On the reverse side (RIGHT) the units of property installed and retired are entered.

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the number of poles (irrespective of size) and the quantities of wire and cable installed and retired during the week. No other items of outside plant need be recorded.

In the Re-usable Retired Outside Plant Material spaces, record the quantities of poles, wire and cable (included in the Outside Plant Retired) which are sufficiently good to be re-used.

In the Equipment, Installations and Drop Wires Junked spaces, record the number of complete telephones, desk or handsets and deskset boxes *junked* and the number of station installations and drop wires *removed* from subscribers' premises or *abandoned*. No entry should be made for installations and drop wires at locations when it is probable that service will be re-established.

Operating Revenues Summary

At the end of each month totalize the Customer Ledger columns for the month just ended, carrying forward page totals so that the totals on the last page will be the totals for the month, and transfer these monthly totals to the corresponding columns of the Operating Revenues Summary. This form provides a monthly and yearly summary of billing to, payments by and accounts receivable from subscribers. The column headings on this form are the same as those on the Customer Ledger form.

Proof of the mathematical accuracy of the totals of each page of the Customer Ledger and of the monthly totals carried from the last page of the Customer Ledger to the Operating Revenues Summary may be determined by making the following checks: Balance due *plus* Local Billing *plus* Toll Billing *plus* Miscellaneous Billing *equals* Total Billing: Total Billing *minus* Discounts and Adjustments *minus* Payments during the month *equals* Balance Due at the beginning of the following month.

On the Revenues Summary form also are spaces for recording receipts from all sources other than Operating Revenues.

UNCOLLECTIBLE OPERATING REVENUES: At the end of the year review the Balances Due from subscribers for the purpose of determining which amounts are uncollectible. Indicate these amounts by a red line around them, add them together and enter the total in the Uncollectible column of the Operating Revenues Summary opposite December.

Do not include the amounts determined as uncollectible in the total of Balance Due (Accounts Receivable from Subscribers) at the end of the year, and do not carry the uncollectible amounts forward in the Customer Ledger after the first of the following year. Any amounts written off as uncollectible and later collected should be entered in the Revenue Summary as "Other Receipts."

Salary and Wages Summary

The Salary and Wages Form is designed to meet the requirements of the Federal Social Security regulations, to serve as a means of combining the weekly wages of employes for entry in the Disbursement Ledger and to make readily available wage data for old age benefits and unemployment insurance tax reports.

The form provides for six employes. At the top of the form enter the employes' names, their addresses and their Social Security account numbers. Each week's payroll will require one line across the form. For each employe enter each week the amount of his wages (before deduction of the Social Security tax of 1 per cent) the 1 per cent tax deduction and his net pay.

In the columns at the right of the form enter the totals of these three items for all employes. Spaces are provided for monthly and quarterly totals required for old age benefits and unemployment insurance reports.

The Disbursement Ledger record of a week's payroll may be made in one entry by entering "Payroll week ended (*date*)" in the Description column, the total Net Pay amount in the "Total" column, the total Tax Deduction *in red* in the Taxes column, and by distributing the total Wages amount to the proper maintenance, operations and telephone plant account columns. When the quarterly old age benefits tax payment is made, enter the entire amount in the Taxes column.

Under this method the total wages is distributed to the proper accounts and the net charge to Taxes is only the portion (one-half) of the tax payment to the government since the red entries in the Taxes column for employe deductions offset half of the black entry made in the Taxes column when the tax payment is made.

[EDITOR'S NOTE: *The bookkeeping system described in this article is not issued by the New York Public Service Commission, but instead was personally developed by Mr. Hinman to assist the small companies. The printed forms can be obtained from the New York State Telephone Association, 25 Eagle St., Albany, N. Y.*]

COMING CONVENTIONS

Telephone Association of Maine, New Hampshire Telephone Association and Vermont Telephone Association, joint meeting at Poland Springs House, Poland Springs, Me., September 12 and 13.

South Dakota Telephone Association, Sioux Falls, October 3 and 4.

United States Independent Telephone Association, Hotel Stevens, Chicago, October 15, 16, 17 and 18.

Independent Pioneer Telephone Association, Hotel Stevens, Chicago, October 17.

Tennessee Independent Telephone Association, Hermitage Hotel, Nashville, October 28 and 29.

Alabama Independent Telephone Association, Montgomery, October 31 and November 1.

Florida Telephone Association, November 5 and 6.

South Carolina Independent Telephone Association, November 11 and 12.

North Carolina Independent Telephone Association, Sedgefield Inn, between High Point and Greensboro, November 14 and 15.

Virginia Independent Telephone Association, Roanoke Hotel, Roanoke, November 18 and 19.

Missouri Telephone Association, Muehlebach Hotel, Kansas City, November 18 and 19.

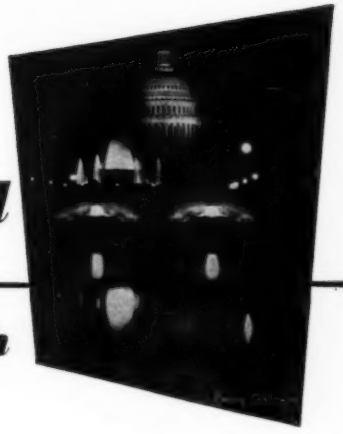
Kentucky Independent Telephone Association, December 3 and 4.

Actress Sings Over Telephone to Prove She's Well

Grace Moore, operatic and motion picture star, recently trilled a few notes to a reporter over telephone wires from her Faraway Farms, near Newton, Conn., to squelch reports she was a patient in Temple University hospital for treatment of a throat ailment.

Miss Moore admitted entering the hospital some time ago for one day "just to shake off a bad cold."

In the Nation's Capital



by Francis X. Welch

Special Washington, D. C., Correspondent for TELEPHONY

***IMPLICATIONS** in Washington regarding control of business generally indicate possibility that critical industrial emergency may be developed. . . . History shows U. S. has come through difficult times without discarding capitalistic system. . . . FCC reported following New York court action relative to hotel surcharges*

YOUR correspondent regrets that he was unable, because of the pressure of other duties, to make the pilgrimage to the Windy City along with the rest of the Washington Scribes and Pharisees to witness the quadrennial Democratic national convention. However, from reports that have been brought back by journalistic friends and from impressions gained via radio and newspapers, the 1940 Democratic meeting seemed to combine all the drama, all the enthusiasm and all the spontaneity of a shot-gun marriage.

For the business world there are certain elements of danger in the attitude displayed by the government forces in command at Chicago. This talk about an international emergency—so grave that it requires supreme sacrifices by everybody from the humblest citizen to the chief executive himself—is pretty strong medicine. It indicates an excited state of mind in Washington—to put it mildly. When it comes time for making these sacrifices, it may be found that business will be called in the first draft, while the greatest suffering expected to be experienced by some official jobholders will be a sentence to serve four more years in office.

This is not to suggest that the administration is likely to declare a war or get us into any international jams in a military sense in the near future. Indeed, a strong isolationist sentiment which has been surging out to the eastern coast from the Middle West and the West has been largely responsible for cooling off some of our administration hotheads along this line. The surprising compromise which the New Dealers made to Senator Wheeler's bloc, as represented by the foreign plank in the Chicago platform, is evidence of this.

No, it is in an economic rather than a military sense that the jittery attitude of the administration threatens trouble. To be frank and blunt about it, there is a danger—not at all a probability—that the administration might go off the deep end and declare some sort of economic martial law which would affect important areas of business. The justification for such a step would be based on the alleged necessity for cutting all red tape and racing up the national defense program.

If you look at most of the regulatory statutes—the Communications Act, for example—you will find that the government is given certain powers during an emergency, especially an emergency of a nature affecting our national defense. There are similar provisions in the Interstate Commerce Act (governing the railroads), in the Federal Power Act (governing the electric power industry), and in the Natural Gas Act.

As far as communications are concerned, the emergency powers deal mostly with the radio industry along lines which have been previously analyzed in this department. The telephone business under an emergency declaration would only have to submit to certain priorities in favor of government traffic and even that, according to the letter of the statute, would seem to be restricted to a period of actual warfare in which the United States would be engaged.

So far it must be conceded that the Federal Communications Commission, while alert to certain dangers to our communications facilities as a result of the critical international situation—such as fifth column activities—has shown commendable coolness and clearheadedness about interfering with commercial operations under color of any "emergency." Chairman Fly of the FCC has definitely shown that the commission is satisfied that the telephone industry in particular is in competent hands. Military and naval authorities in Washington have repeatedly said the same thing.

But while this temperate conduct in Washington officialdom is all very fine as far as it goes, the industry must be alert to sudden changes reflected from the top. In other words, the FCC may think that the communications industries are in good shape, the Army may think so, and the Navy may think so. But if the inner circle suddenly gets a brain storm about the government requiring closer control over the nation's communications systems, and if a message to that effect were sent down to Congress marked "Rush—Emergency," there is no telling what might happen.

THERE are all sorts of stories going around Washington these days about back-of-the-scenes conferences at which such terms as "industrial martial law" are seriously and frequently used. And now that the ultra New Dealers hold the reins of the administration, as well as of the Democratic party (since

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THE LATEST ADDITION TO A

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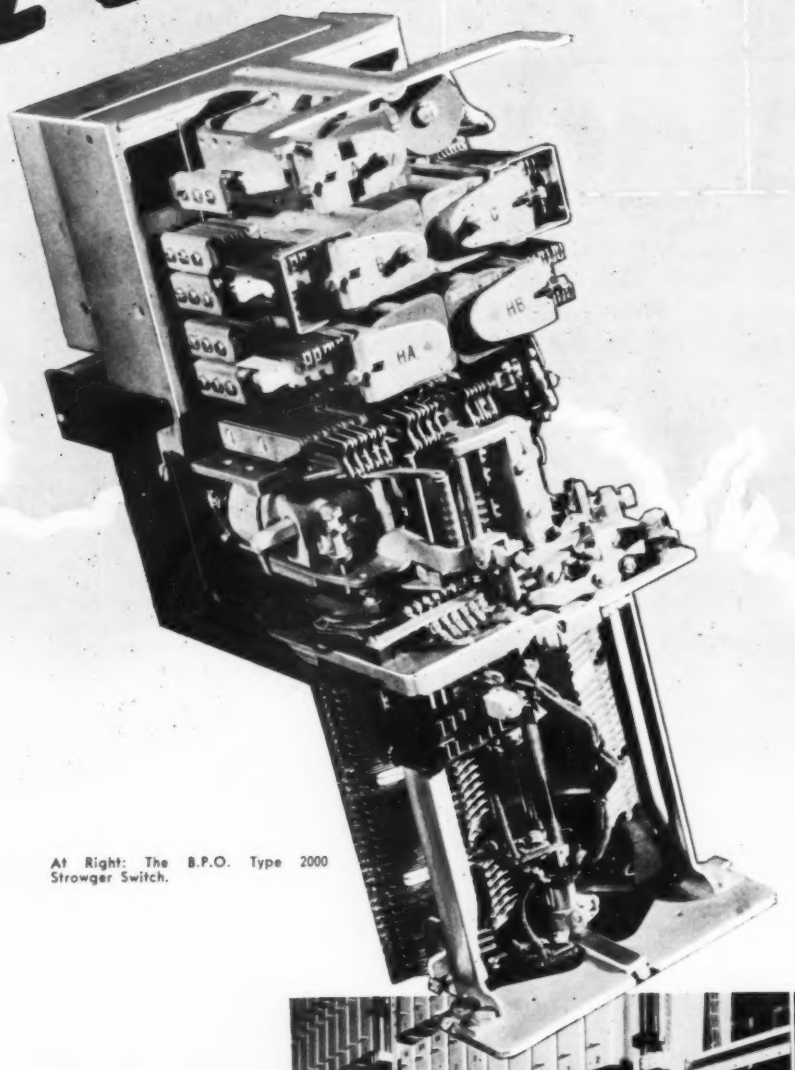

At Right: The B.P.O. Type 2000 Strowger Switch.

Below: Close-up view of Strowger (B.P.O. Type 2000) switches—one row with covers removed.

At Right: Close-up view of rack of line and cut-off relays at Lane Cove.

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A DISTINGUISHED LINE-

AN POST OFFICE ADOPTS B.P.O. TYPE 2000 STROWGER SWITCH FOR ITS NEW "LANE COVE" EXCHANGE . . .

• The recent successful cutover and subsequent smooth operation of the Lane Cove exchange of the greater Sydney network represent an outstanding tribute to the progressiveness of the Australian Post Office. They also mark an important milestone in Automatic Electric Company's long line of accomplishments in world telephone progress.

We take pride in the fact that the B.P.O. Type 2000 Strowger switching equipment used in this exchange was manufactured in its entirety in our Chicago plant—the 27th major installation we have produced for the Australian Post Office since their first use of Strowger equipment almost thirty years ago.

In supplying the equipment for this installation, we have completed all facilities for producing B.P.O. Type 2000 equipment for use in the United States if and when specified by any customer. These new high-speed British-type switches represent a valuable addition to the extensive line of switching mechanisms which we are in a position to supply, and this expansion of our line adds emphasis to the fact that our engineers are not restricted to a single type of equipment, but are free to recommend those types which best meet the conditions surrounding each specific situation.

Inquiries regarding Type 2000 equipment as well as any other type in the Automatic Electric line will be accorded prompt and careful attention.

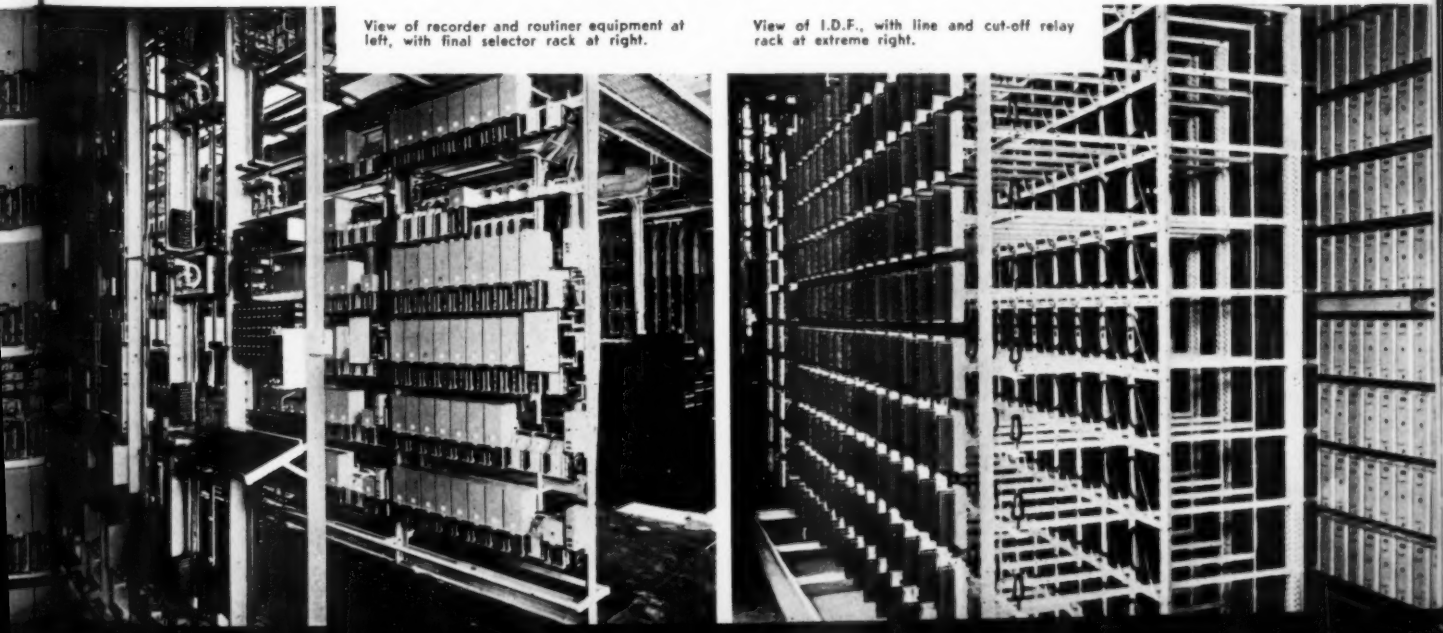
AUTOMATIC ELECTRIC

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions:
AMERICAN AUTOMATIC ELECTRIC SALES COMPANY, 1033 W. Van Buren St., Chicago, U. S. A.
Export Distributors: AUTOMATIC ELECTRIC SALES COMPANY, LIMITED

View of recorder and routiner equipment at left, with final selector rack at right.

View of I.D.F., with line and cut-off relay rack at extreme right.



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Chicago), the voice of the conservative Democrats may not have such a restraining effect as of yore. The "palace politicians" are in full control now; and some of them are known to have some pretty drastic ideas about control of business—emergency or no emergency.

Of course, these implications are directed towards control of business generally. Nothing definite has happened to indicate that the administration is making cat's eyes particularly at the communications industries. The principal bone of contention right now seems to be toward the heavy manufacturing groups—such as steel mills and turbine generating production—where a sudden blizzard of defense orders is likely to result in an attempt to impose vigorous government priorities in the near future.

Would the President dare to risk such bold steps before the general election even if he were seriously considering them? Most Washington observers say no; but that after November, assuming the New Deal is returned to office, industry had better watch out.

A few venture the opinion that the very smoke-up of an alleged emergency which would require a sudden and drastic increase in government control over business production would be excellent justification for the President's decision to run for a third term. In other words, since the President claims that there is an emergency which demands his continuing in office, it would be a good campaign argument to see that at least all the outward appearances of a critical industrial emergency are provided and kept glowing.

There isn't much that business itself can do about this, but it would help a great deal if the people through their representatives in Congress would continue (as they have in the past months) the excellent work of applying cold towels to some fevered official brows.

Specifically, the most temperate and restraining influence on the administration in this respect right now is the continued presence of Congress in Washington. True, now that both of the major parties have made their campaign selections, probably all Congress will be good for until next November will be to talk politics. But even so, as long as Congress stays in Washington the administration would not dare to take too long a lead off base. When Congress adjourns, however (and it must adjourn pretty soon if the Congressmen are going to get in any campaigning at all), we can just keep our fingers crossed and hope for the best.

Now that some sort of an isolationist plank has been forced into the Democratic platform, the administration hotheads may be more on their good behavior. On the other hand, one cannot help recalling the old cynical observation that political platforms are like street car platforms: they are made to get in on and not to stand on.

ALL THE foregoing discussion is not to minimize the existence of a critical situation abroad and the necessity for this country making every effort to speed up the task of making our nation invincible. But if, in the process of making ourselves secure against military dictatorship abroad, we rush pellmell into building up an economic dictatorship at home, we might conceivably some day come to the point of doubt as to whether the game would be worth the candle.

And speaking of critical times which require great sacrifices, our past history shows that our ship of state has come through tough storms before without throwing overboard the capitalistic system. George Washington's second term ended while the world was still stung by the fury of the French revolution.

Thomas Jefferson's second term ended about the time Napoleon was making his great bid for world mastery. We did not get too excited about it on this side of the Atlantic during those times and somehow we managed to do all right. Maybe, as President Roosevelt has pointed out, this emergency is different from any one we have ever had before. Only Time can tell. Meanwhile, we must watch certain Hotspurs in Washing-

BUSY TONGUES

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

"SHE MEANS WELL but she just chatters on without thinking." How often we hear a remark like this about persons who open their mouths and gabble freely about this, that, and the other person or thing, without considering the possible consequences of what they say.

If our tongues could only listen to the reasoning going on in our minds, they would probably hear something like this: "If wisdom's ways you widely seek, five things observe with care: of whom you speak, to whom you speak, and how, and when, and where." What well-ordered lives would be all about us as a result of such listening. How well-ordered our own lives would be, too, if only we would count ten at least before giving our tongue free rein.

Most of us, no doubt, have been in a group of three or four persons, when someone broached a bit of gossip which was a risky, thoughtless thing to do because, unfortunately, there was a certain person present, who had a reasonable right to wish that the matter had not been mentioned. How jittery it made everyone in the group feel, possibly including the one who gave her tongue free range. How glad we were not to be the one who spoke too freely, although we may have been interested in the bit of gossip.

We don't want to keep quiet just to be on the same side with people, because that might mean we felt we must always pretend we believe we agree with what they say, whether we do or not. Is there anything more disturbing than talking to people who always agree with everything you say when you know they really do not?

Then there is also the salesman who makes life difficult for the one who has a convenient door-bell button he can park on. He makes a door-stop of his foot, then lets his tongue spin his sales yarn so fast the prospect cannot wedge a word in to tell him she doesn't want a vacuum cleaner because she has one.

The button parker does not realize it, but he definitely registered no sale long before he reached the part of his sales talk that has to do with young men earning their way through college selling vacuum cleaners.

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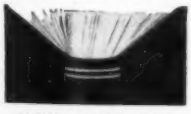

Based on Tested Methods—Not Theories

For illustrative material and definitions the authors have used numerous citations from background and key cases decided by commissions and courts, and in no instance is any material offered which has not been actually tried and found workable.

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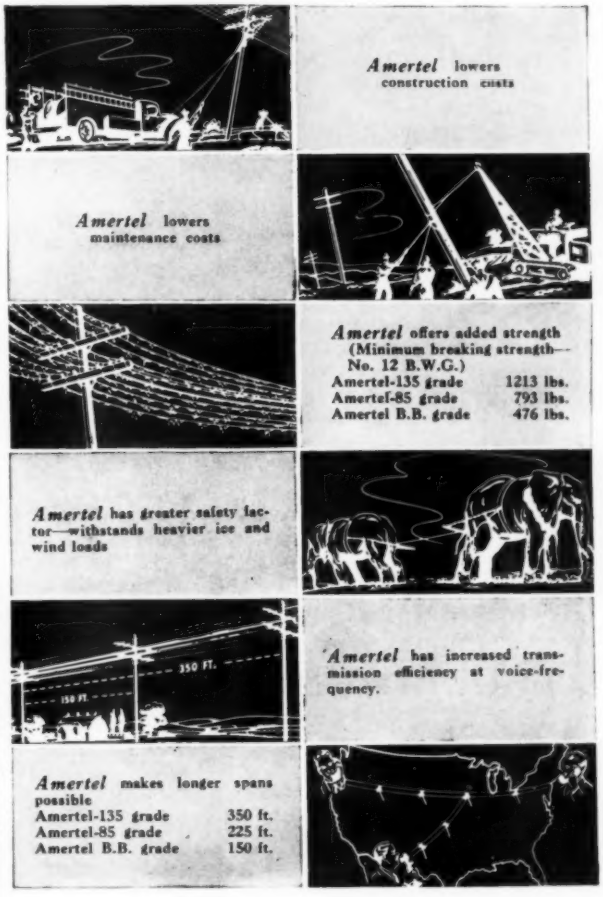
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THE name Amertel, even though it is but a few months old, has already established itself as a leader in Telephone and Telegraph wire economy. The most important improvements embodied in Amertel-85 and Amertel-135 are illustrated here, and a glance at these developments should convince you that it will be well worth your while to fully investigate the many advantages Amertel can offer you. Our distributors are in a position to supply you with Amertel-85 and Amertel-135 Telephone Wire as well as the regular grades "EBB"—"BB" and "Steel."

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UNITED STATES STEEL

ton who seem only too anxious to grab Time by the forelock.

Incidentally, a telephone sidelight on the Democratic National Convention shows that there are a lot of people even on the Eastern coast who are not prone to get too excited about passing political phenomena and who even actively resent the intrusion of such matters upon their normal habits.

According to one of the national broadcasting networks, 2,000 indignant citizens in the metropolitan area of New York alone called up on the evening of Wednesday, July 17, to protest against the Armstrong-Jenkins prize fight being sidetracked for the proceedings of the Democratic National Convention. One thousand telephone calls registering similar protests were received by the New York Times newspaper office.

When we stop to think that there are so many people more interested in a prize fight than in a momentous presidential nomination, there must be many more who are interested in neither prize fights nor nominations and who passed a dull evening fretting because their favorite dance music program or mystery thriller had been thrown off the air waves. Surely the grass roots of America cannot be accused of hysteria while such a condition obtains.

COMMUNICATIONS industries received little attention from either of the two major parties in their platforms. Both Republican and Democratic platforms contained short paragraphs on radio. The Democratic platform urged "such legislative steps as may be required to afford the same protection from censorship that is now afforded the press under the Constitution of the United States." This was a rather puzzling reference. Your correspondent has been unable to find out why it was put in the platform, who put it in, and just what all the shooting is about.

The present Communications Act protects the radio from official censorship. True, there has been some more extreme criticism of the FCC on the grounds of alleged attempts to censor the radio directly or indirectly. But there has not been enough agitation nor evidence of official abuse along this line to support a constitutional amendment. The same observation might apply to the Republican plank, similar in tone, which is as follows:

> The principles of a free press and free speech, as established by the Constitution, should apply to the radio. Federal regulation of radio is necessary in view of the natural limitations of wave lengths, but this gives no excuse for censorship. We oppose the use of licensing to establish arbitrary controls. Licenses should be revocable only when, after public hearings, due cause for cancellation is shown.

It is difficult to see just how the radio could be made precisely as "free" as the press because of its physical limitations. Anybody can start a newspaper who has the price. But anybody with the price cannot start a radio station because there is just room on the air waves for so many and, as a result, there must be a certain amount of selection in the public interest. About the nearest thing we could come to protecting the radio from a suppression of freedom of speech would be to protect it from official censorship or from domination in a manner so painfully familiar in totalitarian European countries.

Since this is just about what the present Communications Act provides, the object of both platform planks is probably more in the nature of flag-waving and window-dressing than a serious recommendation for major legislative action.

TELEPHONE affairs at the FCC seem likely to reach the usual hot weather low point during the coming weeks, although for obvious reasons the radio branch will continue active throughout the summer.

One new telephone matter which the FCC has taken under observation is the subject of hotel telephone calls. Early this year the New York Public Service Commission limited hotel surcharges to 5 cents for local calls and 10 cents for toll calls.

While it was not clear how the New York commission could have any authority over a hotel's charges to patrons for switchboard service, the commission took the attitude that telephone companies (admittedly under the commission's jurisdiction) should refuse service to hotels failing to comply with the commission's regulation. A few hotels refused to obey the order and a friendly suit is now being tried in the New York courts to determine the commission's authority in the premises.

The FCC is reported to be following this litigation with considerable interest. Of course, the FCC itself could only have control over interstate toll charges collected by hotels. But assuming that the authority of the New York commission is sustained by the courts, it will not be surprising if the FCC takes steps towards securing uniformity on a nation-wide basis for interstate telephone calls terminating in hotels where toll charges and surcharges are collected in the first instance by hotel managements.

TELEPHONY'S Index for Volume 118

which was completed with the June 29 issue, is now ready for distribution among those who keep complete files. In this index are listed all of the important articles and items which appeared in the issues of TELEPHONY from January 6 to June 29, 1940. The index affords a ready reference and will be supplied free of charge to those making application. Write:

Telephony Publishing Corp.
608 S. Dearborn St.,
Chicago, Ill.

Station-Gain Rivalry Between Minnesota Towns

In Minnesota there is rivalry between telephone companies as to station gains. In the local Canby newspaper, and also in several other papers, an item was published to the effect that as a result of increases in the number of subscribers an addition would have to be made to the switchboard in the Canby exchange of the Central Electric & Telephone Co. "There are now 394 telephones in use here," the item continued, "the largest number in the history of the city. In addition, there are 271 rural telephones connected with the Canby exchange."

Quoting the number of Canby telephones, a columnist in the Granite Falls Tribune the following week, comments: "To show you what a telephone town Granite is: While it has about the same population as Canby, Manager Wilder tells us there are 538 telephone installations within this city and more in view. Incidentally, Manager Wilder was asked to attend a meeting Friday held by the state association to tell other telephone managers how he secures subscribers. The Granite company is one of the shining examples of the state."

New Ideas for Plant and Exchange

By RAY BLAIN

WHAT IS YOUR "pet kink" or best method of doing a certain job? Why not tell others through this department?

Grade Clamp Arrangement for Aerial Cable

"We find the use of grade clamps on aerial cable necessary but also often troublesome," writes Daniel Seitz, cable superintendent of the York (Pa.) Telephone & Telegraph Co. "The accompanying sketch indicates a method which we have successfully used for more than eight years without a single case of trouble caused by them or any sheath breakage due to vibration. The common type of grade clamps often causes trouble due to sheath breaks as it absorbs the vibration in the span. The type clamp here described permits the cable to swing and roll but not creep down grade and neither does it absorb vibration."

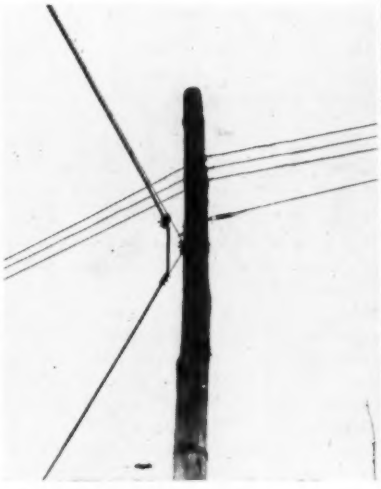
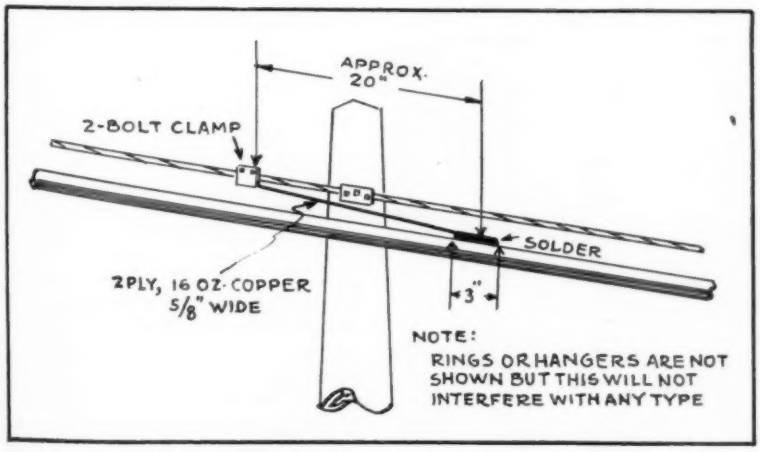


Fig. 2. Regular grade clamps at corner pole. Originally the cable followed messenger strand and now shows effects of the creeping in each direction.

Fig. 1. Special grade clamp used on each side of pole fixture.

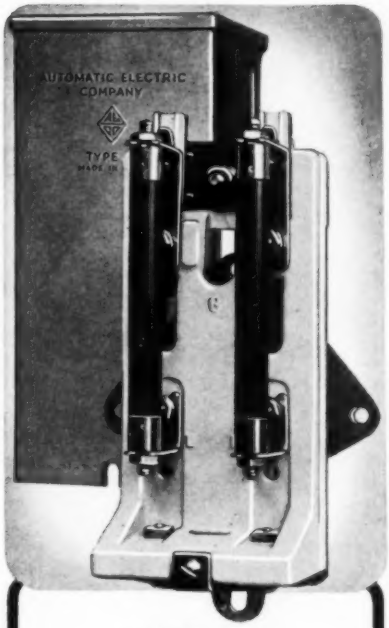
With this arrangement a clamp may be used to attach the copper ribbon to the lead sheath; however, when experienced cable men are available, it is preferable to solder it direct to the sheath. This soldered connection should cover a fairly large area so that there



Grade clamp arrangement successfully used by York (Pa.) Telephone & Telegraph Co. for a number of years.

SANDS

SUBSTATION PROTECTOR



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for Indoors or Outdoors

Here is a new weather-proof design which provides better protection at lower cost on any type of line. It saves installation cost because its new "Four Point" bracket makes mounting easier. It pares maintenance expense, thanks to the Type 2105 discharge block, which resets itself after operation.

Next time, order Type 15; it assures you complete protection.

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XUM

will be no danger of tearing the sheath. On extra steep grades, a separate fixture should be placed at each pole to divide the strain.

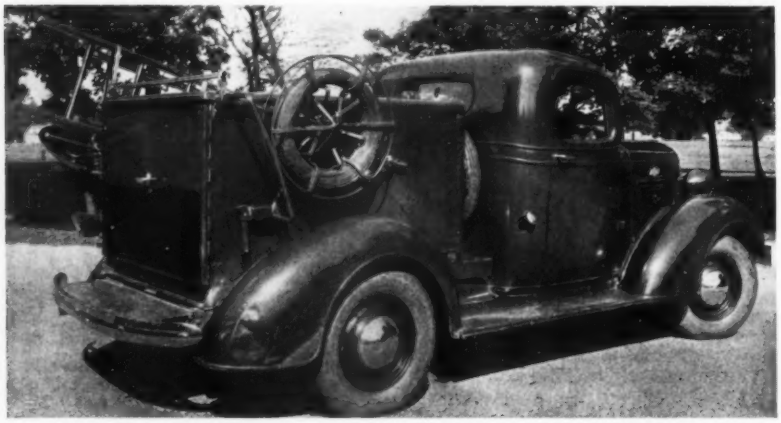
Mr. Seitz is now considering the use of a flexible copper ribbon with a tab on one end for soldering to the cable and the use of a small one or two-bolt clamp for attaching the other end to the strand. These fixtures have been successfully used by the York company for holding cable on all types of corners. This is on the theory that if there is creeping in a cable there is also a place where it creeps from. Thus it is preferred to use a fixture to hold it in each direction as indicated in Fig. 1. Fig. 2 which shows a grade clamp on each side of a corner indicates clearly that considerable cable has pulled away from this particular corner which is located on the peak of a hill. It is not a cable of the York company.

Platform on Telephone Maintenance Truck

An idea for the modification of a light installation or trouble truck is described by Staff Sergeant Richard T. Brown, with the Signal Corps at Aberdeen (Md.) proving grounds. With this type of truck it is possible to conveniently carry only two men in the cab while occasionally it is necessary to transport a greater number of men on one truck.

To make this latter possible for short distances only, a platform was made by installing a piece of boiler plate across and on the inside of the rear bumper. This plate was then welded to the bumper braces to hold it firmly in place. The bumper along the rear edge projects about one-half inch above the plate and makes a convenient platform for two men to stand on, something on the order of some fire department trucks.

A hand rail constructed from a piece of pipe was placed across the rear of the body on the top and held in place with two brackets. Men can stand on the platform, hold to the hand rail and travel in complete comfort and safety for short distances without causing the slightest injury to the truck.



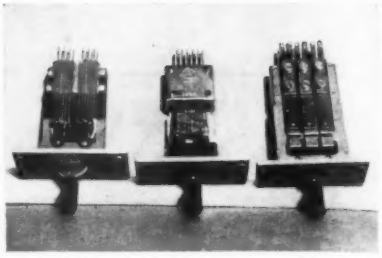
A platform and hand rail installed on the rear of a light installation truck body enables men to travel short distances in safety and comfort.

New Foreign Type Clickless Switchboard Key

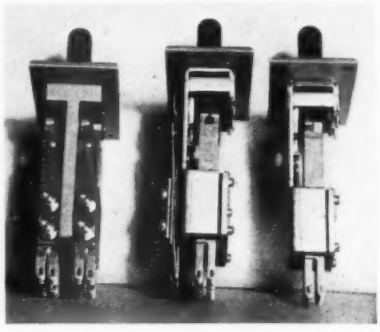
Samples of switchboard keys of new design have been received from the Telefon Fabrik Automatic of Copenhagen, Denmark. Although probably not practical for use with our type of equipment, they are of interest and are patented in this country.

The keys shown in the illustrations are known as the two-axle type. They have a Z-shaped spring of wire on the back of the mounting so that the springs of the contact metal alone are not relied upon to operate and restore the key. The frame of one key is moulded and the other is constructed of sheet metal. The sheet metal type holds the springs with a clamping effect which reduces considerably the number of insulating bushings required. The moulded key may be fitted with as many as 40 contact springs. The sheet metal type key has been made with a total of 86 different spring combinations.

While this type of key would likely be more expensive to manufacture than the conventional type, numerous advantages are claimed for it by the manufacturer. A fault with many ordinary switchboard keys in some cases, he says, is that the lever, when being returned to the vertical position, has a tendency to slip over on the other side. This causes an unwanted contact, resulting in a click in the ear of the operator when used as a ringing and listening key on a switchboard. This fault is impossible with this new type and for this reason is known as the "clickless key."



The moulded frame type of key is on the left, and the formed sheet metal types are in center and on the right. Note how the springs are clamped in place on center key. Some extra springs are mounted on the side of the key on right.



Another view of the moulded type key (left) and the sheet metal type (center and right). Note in the latter two keys how the springs are held with a clamping effect and that no bolts are placed through springs themselves.

Some Telephone Things I Didn't Know Until Now

BY OSCAR WILL TELL

That the new fluorescent tube type lighting is now available for use in the telephone exchanges.

That a quiet fan with rubber blades and without a protective guard has been developed for use in the ventilation of telephone booths.

That a non-magnetic, voice-powered, crystal-operated telephone is now available. It is said to give perfect audibility and voice fidelity without the use of batteries of any kind.

That a flashlight bulb extension for use in lighting hard-to-get-at places has been developed. The extensions come in lengths of six inches to 36 inches. The extension plug screws into any flashlight with the bulb in the opposite socket.

Here and There in the Field

Employes' Picnic Has Bathing Beauty Contest

In the shade of stately oaks and ancient sycamores that surround the Uplifters Club in Santa Monica Canyon, Calif., a noted beauty spot, employes of Associated Telephone Co., Ltd., held their annual picnic July 13.

"The most beautiful telephone employe" was the title awarded HELEN HENSLER (center, wearing big hat) at picnic of Associated Telephone Co. employes. Miss Hensler works in commercial department at Santa Monica, Calif. Second place was awarded BETTY MOSELEY (left) of Santa Monica, and third to ELLA DUNN (right), Pomona operator. Gifts were presented to the girls by President CHAS. F. MASON, who looks very pleased about the whole thing.

Choosing a fiesta theme, the entire day was a modern version of early California revelry.

Among the countless events that filled the day was a parade of bathing beauties from whose ranks was selected the most beautiful telephone employe. Winner of the title was Helen Hensler of the commercial department at Santa Monica, and C. F. Mason, president of the company, presented her with a fitted traveling case. Second place was taken by Betty Moseley, of Santa Monica, and third by Ella Dunn, Pomona operator. Adding a comic note to the pageant of beauty, bathing suits of the 1910 vintage were modeled by employes.

Sixty golfers teed off in the early morning to start the battle for possession of the C. F. Mason golf trophy, which went to Herbert Hussey, plant superintendent of Santa Barbara, for the third consecutive year, making him permanent holder of the cup. Tennis, badminton, swimming and diving contests were held in the outdoor pool and on the extensive courts of the club.

The afternoon was filled with field events for young and old, held on the Will Rogers Memorial Polo Field which is a part of the club grounds. Mid-afternoon featured a playoff baseball game between two of the company's high ranking teams, Pomona and Long Beach. Possession of the Eliot H. Cheadle trophy was transferred from the former title-holders to the Long Beach nine.

Many southern California notables were presented by President Mason to the crowd of approximately 1,200 diners who gathered at the long tables for a charcoal broiled steak dinner. Among those were Congressman Leland Ford, Mayor C. E. Crawford and Commissioners Milliken and Freeman of Santa Monica, Eugene Biscailuz, sheriff of Los Angeles County and member of an early California family.

Scores of costly prizes were awarded winners of the various events and Spanish music by a talented trio of costumed serenaders featured the dinner hour.

In the ballroom of the Uplifters Club the evening was spent in dancing to the music of the Bryant Washburn Jr. Troubadours. Bryant Washburn, Sr., one time famed motion picture star, was in attendance. An unusual floor show varied the evening's entertainment.

▼ ▼

Facilities Added to Handle Willkie's Acceptance Speech

Five crews of the Indiana Bell Telephone Co. are placing a new 51-circuit cable between Elwood and Alexandria, Ind., to provide additional facilities that will be necessary in connection with the acceptance speech of Wendell L. Willkie, Republican presidential nominee.

The cable will connect Elwood with outlets at Anderson, Marion, Muncie and Indianapolis. It is being installed

RELIABLE

No. 1000 OUTDOOR PROTECTOR

Build for the future with these FEATURES

This protector combines compactness with substantial construction. Housed in a weatherproof seamless cover, it provides fuses and air gaps for protection against static and power line crosses. Separation of fuses permits easy installation of all wires. Available with various types and lengths of standard telephone fuses. Furnished with upturned bracket when specified. Approved and listed by the Underwriters' Laboratories.

Complete information on request.

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OVER 25 YEARS SERVICE TO THE UTILITIES

in anticipation of requests for leased wire service by newspapers, wire services, telephoto and broadcasting companies.

Unique Float Designed by Illinois Manager

A new idea in floats for a community celebration comes from the Dixon (Ill.) Home Telephone Co. The float, shown in an accompanying photograph, was designed by Harry H. Bates, secretary and manager of the company. It consisted of an organ, decorated like a switchboard, and of telephone materials cleverly arranged. At each end of the float was a telephone pole with crossarms and insulators in place, and wires connected the two poles. Hung on the wires were banners featuring the "Speed," "Economy," "Protection," and "Pleasure" of telephone service.

The float was one of 40 in a parade arranged by the city of Dixon in celebration of homecoming on July 4. During the parade popular musical numbers were played on the organ by a young lady dressed in white and properly equipped with a standard operator's headset. Also on the float was a large placard bearing the words, "Welcome Homecomers," and which was intended to represent the July issue of the Dixon company's telephone directory. A modern handset completed the arrangement.

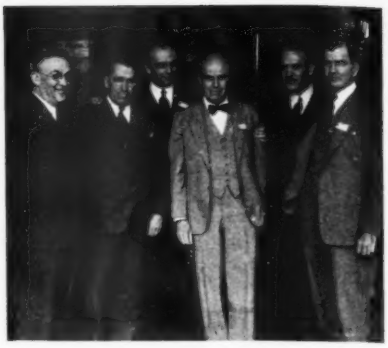
The telephone float received much handclapping as it went along the line of march, indicating it was well appreciated. For several days afterward various employes of the company were congratulated by many citizens on the conspicuous showing the telephone company made in the parade. In fact, many persons made a special visit to the commercial office to express their enthusiasm and approval. Mr. Bates states that the float was an economical one for a telephone company to construct.

Resolutions Passed at Washington-Oregon Meeting

Acting under the chairmanship of G. E. Krieger, sales and traffic manager of the West Coast Telephone Co., Everett, Wash., the resolutions committees of the Washington and Oregon Independent Telephone Associations passed a number of resolutions at the joint convention held at Hood River, Ore., June 28 and 29.

A resolution on occupational taxes concerned the immediate action of the associations and members to obtain approval of regulatory authorities to pass "such additional taxes, levies and assessments which have not heretofore been considered in determining rates, on to the subscriber."

Another resolution dealt with tax exempt utilities. The associations expressed the belief that certain public utilities operating in the two states are not now taxed on an equitable basis with privately-owned utilities and other businesses and industries. The associations resolved that members would urge their state senators and representatives to institute constitutional changes to permit the taxing of municipally and publicly-owned utilities on a basis equitable with that followed in taxing privately-owned utilities and other businesses in general.



At the Illinois convention in Peoria a group of prominent telephone men was "snapped" outside the hotel. From left to right are LOUIS PITCHER of Chicago, executive vice-president of U. S. Independent Telephone Association; GARLAND FOSCUE of Chicago, vice-president of Automatic Electric Co.; H. F. McCULLA, general commercial superintendent, Lincoln (Neb.) Telephone & Telegraph Co.; CHAS. C. DEERING of Des Moines, Iowa, secretary-treasurer of Iowa Independent Telephone Association and also of U. S. Independent Telephone Association; M. A. HIGGINS, general manager, Illinois Central Telephone Co.; OSCAR BURTON of Tyler, Texas, president of Texas Telephone Association and general manager of Gulf States Telephone Co.

Other resolutions covered the minimum wage law, uniform accounting and rate making practices for all utilities, toll settlement, rural electrification, maximum learner period, and others of a miscellaneous nature.

In addition to the directors of the Washington association reported elected in TELEPHONY July 13, page 17, the following were also elected: C. E. Johnston, vice-president and general manager of the Interstate Telephone Co., Spokane, Wash., and Lloyd Gates, general manager of the Bothel Telephone Co., Bothel, Wash.

General Telephone Corp. Has Small June Station Loss

General Telephone Corp. reports for its subsidiaries a loss of 23 company-owned telephones for the month of June, 1940, as compared with a gain of 802 telephones for June, 1939. The gain for the first six months of 1940 totals 14,775 (exclusive of purchases) or 2.95 per cent as compared with a gain of 12,421 telephones or 2.70 per cent for the corresponding period of 1939.

The subsidiaries of General Telephone Corp. now have in operation 517,069 company-owned telephones.

This unusual float of the Dixon (Ill.) Home Telephone Co. has utilized telephone poles, with crossarms and wires in place, to emphasize the "Speed," "Economy," "Protection" and "Pleasure" of telephone service. On the float was placed an organ decorated like a switchboard, and a young lady wearing an operator's headset played musical numbers during the homecoming parade on July 4 in Dixon. A huge placard, welcoming "Homecomers," and a modern handset completed the float which was designed by Manager Harry H. Bates.

Financial Data

Many Nebraska Companies Fail to Pay Expenses

Of the 144 telephone companies doing business in Nebraska during 1939, 120 of them failed to pay operating expenses and other costs as shown in a summary of annual reports made by the accounting staff of the state railway commission. None of the 30 Class F companies earned a dividend, but as a whole they were able to pay operating costs. Outside of the Lincoln Telephone & Telegraph Co. and the Northwestern Bell Telephone Co., the 112 class A to E companies had about the same financial results as in 1938. They lost some telephones, and revenues correspondingly decreased.

These 112 companies had operating revenues of $1,284,208 and other revenues of $26,136. Operating expenses of $1,047,256, taxes of $97,613, interest of $100,738 and miscellaneous costs of $26,651 made a total of $1,272,258. Twenty-six companies paid total dividends of $58,660 on a property investment of $8,657,971. The total investment in this property is $51,436,579, the Lincoln company being credited with $15,002,989 and the Bell with $27,775,619. The 112 companies have 9,185 stockholders and the Class F companies 641.

Class F companies, with capital stock of $821,112, had revenues of $38,322, taxes of $917 and total disbursements of $37,667. They serve 702 city subscribers, 1,213 farm subscribers and switch 831, the total of owned stations being 1,915.

The other companies, excluding the Lincoln and Northwestern Bell companies, have capital stock of $3,277,318, notes and bonds of $2,163,649, depreciation reserves of $2,414,065 and surplus and undivided profits of $484,978. Thirty-eight of them have neither surplus nor undivided profits, and six are without depreciation reserves. Book cost of property was $7,438,063 and other assets are $1,212,908.

Nebraskans paid a telephone service bill of close to 10 million dollars in 1939, including tolls. The 112 companies had revenues of $1,284,208, the Lincoln company $2,642,387 and the Northwestern Bell $5,940,437, a total of $9,867,033. Other revenues, excluding the Bell which made no report thereon, totaled $74,998.

At the close of 1938 all of the 144 companies operated 217,871 stations, divided as follows: Northwestern Bell 103,803, Lincoln 64,461, Class F companies 1,694 and the others 47,914. At the close of 1939, there were 219,481 stations operated by all of them, divided as follows: Lincoln 64,100, Bell 105,390, Class F companies 1,915 and all others 47,451. These were further divided as follows, excluding Class F companies:

Business, Bell, 36,477; Lincoln, 17,397 and all others, 9,829.

Residence, Bell, 65,224; Lincoln, 35,351; all others, 19,354.

Rural, Bell, 4,229; Lincoln, 11,352; all others, 18,269.

Switched stations, Bell, 7,982; Lincoln, 851 and all others, 9,415.

All of the companies save those in Class F showed a continued decline in the number of farm subscribers.

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Favorable Gains Made by Ridgway, Pa., Company

Net telephone earnings of the Home Telephone Co. of Ridgway, Pa., increased from $32,874 in 1938 to $34,756 for 1939, an increase of $1,882 or 5.72 per cent. The annual report to stockholders by President John H. Wright, Jamestown, N. Y., also shows favorable gains in all departments during 1939.

Operating revenues for the year were $169,481, a gain of $6,886, or 4.24 per cent over 1938. Telephone expenses were $134,725, an increase of $5,004 or 3.86 per cent. Income for dividends totaled $21,545, as compared with $18,770 in 1938. After payment of dividends on the preferred and common stocks, 2.09 per cent of the operating revenues or $3,545 remained for surplus, an increase of $2,775 over the $770 which remained in 1938.

At the end of 1939 the company was serving 3,973 company-owned exchange stations and 69 stations on lines owned by others, a total of 4,042. The net increase in stations for the year was 185, compared with increases of 66 in 1938 and 256 in 1937.

The daily average number of exchange messages for the year was 21,899, which compares with 20,921 for 1938. Toll calls originated during 1939 numbered 132,722, an increase of 5.39 per cent over 1938.

Taxes charged to operations in 1939 totaled $15,001, compared with the charge of $12,980 for 1938. The 1939 tax bill equalled $5.00 per share of

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common stock, $267.87 per employe and $3.71 per telephone in service.

During 1939 gross additions to property amounted to $47,675, compared with $41,513 in 1938. Gross retirements at original cost during 1939 were $28,579. The cost of telephone plant at the end of the year was $767,104.

Stating that studies of original cost of telephone plant at the time of its first dedication to the public use were completed in 1939, Mr. Wright said: "These studies were made in compliance with a general order of the Pennsylvania Public Utility Commission. As a result the undepreciated cost of telephone plant was increased by $20,211; the reserve for depreciation was increased $18,876; surplus was decreased $16,518, and a telephone plant acquisition adjustment account in the amount of $30,122 was created.

"During the year $1,780, representing the amortization of the telephone plant acquisition adjustment applicable to the year 1938, was charged to surplus and $1,780 was amortized as an operating expense for 1939, leaving an unamortized balance of $26,561 at the end of the year. It is proposed to continue this amortization expense in the same annual amount for approximately 15 years in the future."

Officers of the Home Telephone Co. of Ridgway are: President, John H. Wright; vice-president, Lloyd C. Wright; manager, G. F. Evert; secretary, Arnold P. Holmberg; treasurer, Manford H. Johnson and auditor, J. Edw. Wilson.

Members of the company's board of directors are: Harry S. Conrad, St. Mary's, Pa.; Gordon F. Evert and Manford H. Johnson, Ridgway, Pa.; S. F. Nixon, Westfield, N. Y.; J. E. Sweeney, Warren, Pa.; R. A. Taylor, Emporium, Pa.; John H. Wright, Lloyd C. Wright and Arnold P. Holmberg, Jamestown, N. Y.

Hawaiian Independent Reports on 1939 Operations

A new record of gains in company-owned stations was established by the Mutual Telephone Co., Honolulu, Hawaii, in 1939, comments President John A. Balch in the company's annual report. The increase was 2,902 stations as compared with 2,826 added during 1937, the former record year. The percentage gain over stations in service December 31, 1938, was 9.01 per cent.

There were 35,107 company-owned stations at the close of 1939, 323 private-line stations and 1,724 telephones on military reservations that are furnished exchange service, making a total of 37,154 telephones in the system.

Marked difference was shown in the classes of service affected by the new installations during 1939. In the previous year, gains in main-line business telephones, private branch exchange stations and business extensions showed much higher percentages than residence stations. In 1939 the percentages were reversed and residence telephones and extensions showed the highest percentages.

The effect of this shift in classifications is shown by the fact that local service revenues increased only $107,000, or 6.40 per cent, as compared with a gain of $201,000, or 13.57 per cent in 1938 when there were 216 less installations.

The total operating income for the year was $2,141,622.42 as compared with $2,039,854.71 in 1938, an increase of $107,767.71 or 4.99 per cent. Telephone operating expenses amounted to $1,397,698.34, an increase of 4.81 per cent over 1938. This increase is largely due to increased payrolls caused by reductions in working hours and to taxes.

Uncollectible accounts, $5,590.70, were almost exactly the same as the amount written off in 1938 but the percentage of .26 was lower than the previous year due to increased revenues. Collection methods have been improved in a constant effort to reduce these losses.

Total taxes for 1939 amounted to $313,009.61. Of this amount $292,683.70 was accrued against income and $20,325.91 was charged to capital and other accounts. Taxes accrued against utility revenues totaled $285,700.90, approximately 4.25 per cent more than 1938, and represented $1.00 of taxes for each $7.50 of gross revenue and 7.50 per cent of the capital stock.

Net income for 1939 was $401,232.66, an increase of $5,235.23 above the 1938 figure, but additional investment in plant during the year was approximately $525,000. The earnings for the year were $1.056 per share on capital stock. Dividends amounting to $342,000, or 90 cents per share on the 380,000 shares outstanding were paid during the year.

During 1939 the inter-island radiotelephone system increased its volume of business and further proved its importance as a part of a territory-wide communications system. During the year 36,701 calls were handled and gross revenues amounted to $86,042.50. Because of rate reductions effected August 1, 1938, and March 1, 1939, there was a decrease of $14,466.50 in

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revenue in spite of a gain of 5,288 calls over the year 1938. The general trend throughout the year was upward and it is believed that the increase in the use of service should compensate before long for the loss in revenue.

The volume of trans-Pacific traffic was 24.7 per cent higher in 1939 than in 1938, the daily call average being 14.1 against 11.3. The revenue gain, however, was only 4.7 per cent. Early in the year traffic reports indicated that the rate reduction made on October 1, 1938, was not sufficient to attract new business and further reductions were made November 1, 1939.

The wireless department showed a loss of $2,472.53 for 1939, due largely to the reduction of inter-island radiotelephone rates, although the ship-to-shore traffic also was reduced. In 1939 there were 40,000 inter-island messages, compared with 48,780 in 1938, a loss of 8,780 or 18 per cent. Ship messages totaled 13,227 compared with 14,904 in 1938, a difference of 1,677 or 11.3 per cent. Operating revenues for the department decreased approximately 16 per cent.

The total number of employes as of December 31, 1939, was 657, an increase of 162 since 1934. The total payroll for the year was $1,034,882.89, an increase of $350,795.63 since 1934.

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Annual Report of Meadville (Pa.) Company

Operating revenues of the Meadville (Pa.) Telephone Co. in 1939 were $219,253, an increase of $12,316, or 5.95 per cent over 1938. The annual report submitted to stockholders by President Lloyd C. Wright, Jamestown, N. Y., reveals that despite favorable increases in total operating revenues the net telephone earnings decreased $1,692 or 3.58 per cent from the 1938 earnings.

Telephone expenses for the year were $173,673, an increase of $14,008 or 8.77 per cent over 1938. Maintenance expense increased from $32,071 in 1938, to $35,642 for 1939. Depreciation expense increased from $38,334 to $39,947. Traffic expenses were $38,930, an increase of $4,233 over the $34,697 reported for 1938.

Commercial expenses totaled $8,484, compared with $8,045 for 1938. General office salaries and expenses were $22,594, an increase of only $529 over the $22,065 for 1938. Further operating expenses were $6,287, compared with $4,405 for 1938.

Taxes charged to operations in 1939 totaled $21,806, which compares with $20,047 for 1938. The 1939 tax bill equaled $3.63 per share of common stock, $213.78 per employe, and $4.07 per telephone in service.

The income available for dividends totaled $30,219, as compared with $32,328 in 1938. After payment of dividends on the preferred and common stocks, 2.2 per cent of the operating revenues or $4,719 remained for surplus, a decrease of $2,109 from the $6,828 which remained in 1938.

As of December 31, 1939, the Meadville company was serving 5,360 stations, a net increase of 382 for the year compared with increases of 261 in 1938 and 368 in 1937. The net increase consisted of 262 residence and 120 business telephones.

The daily average number of exchange messages for the year was 21,898, which compares with 21,688 for 1938. The toll calls originated during 1939 numbered 214,658, an increase of 4.65 per cent over 1938.

During 1939, gross additions to the property amounted to $95,127 compared with $77,126 for 1938. Gross retirements during 1939 amounted to $58,805 and the book value of the telephone plant was $982,018 as of December 31, 1939.

Officers of the Meadville company, in addition to President Lloyd C. Wright, are: Vice-President, John H. Wright; manager, L. E. Whiting; secretary, Arnold P. Holmberg; treasurer, H. M. Dickson, and auditor, J. Edw. Wilson.

Members of the board of directors are: H. M. Dickson, C. C. Johnston, Earl W. McGill, L. E. Whiting, H. C. Winslow, all of Meadville; Hugh Moore, Cochranton, Pa.; R. D. Wolfe, Pittsburgh, Pa., and John H. Wright and Lloyd C. Wright, Jamestown, N. Y.

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Scottsbluff, Neb., Company Reports 1939 Net Income

The Platte Valley Telephone Corp., Scottsbluff, Neb., reporting to the Nebraska State Railway Commission, shows for 1939 subscribers' revenues of $150,004; toll, $89,738, and miscellaneous, $4,179, making a total of $243,639, an increase of $14,266 over the previous year.

Total operating expenses of $146,964, consisted of maintenance expense, $24,098; depreciation, $50,675; traffic, $36,297; commercial, $14,143; general, $17,561, and miscellaneous, $4,197. Net operating income was $96,673; taxes paid, $23,901; interest on funded debt, $19,075, and other interest payments, $24,998, leaving a net income of $27,125.

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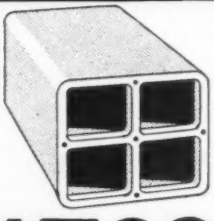

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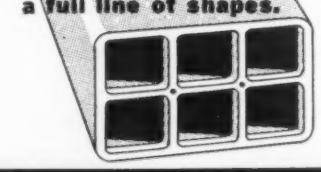

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Commission and Court Activities

NLRB Examiner Reports on Northern Ohio Company

The National Labor Relations Board announced July 9 that Trial Examiner George Bokat had recommended that the Northern Ohio Telephone Co., Bellevue, cease and desist from domination and recognition of the Northern Ohio Telephone Employes Council, an alleged company union.

Regional Director Oscar S. Smith of Cleveland said that the trial examiner's report was based on recent hearings which followed the filing of a complaint May 14 by the Utilities workers' organizing committee (CIO). The company was given 20 days to file exceptions to the report.

The Northern Ohio Telephone Co. announced that a bill of exceptions would be filed as the first step to appeal the case to the National Relations Board in Washington.

Pending the outcome of the hearing before the NLRB in Washington, the labor situation as far as the Bellevue company is concerned will remain the same.

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New York Bell Signs for Collective Bargaining

The New York Telephone Co. announced July 18 it had signed a collective bargaining agreement to run one year. The agreement is with the United Telephone Organizations, an independent union with a membership of 10,000 employed in the company's plant department in New York, the Long Island area and in Westchester, Rockland, Putnam and Dutchess counties. The men do all of the repair, installation and maintenance work and the general testing of lines.

The agreement recognizes the United Telephone Organizations, a group of four unions covering various parts of the area described, as sole collective bargaining agency. It freezes the basic rates of pay and wage progression during the term of the contract. It provides for arbitration of grievances between the company and the union, designating the State Mediation Board as the agency authorized to appoint an arbitrator when a dispute cannot be resolved by direct negotiation.

Other provisions include seniority rights, 30 days' notice of layoffs, with termination allowances based upon length of service ranging from one to three weeks' pay, and vacations with pay of from one to three weeks, likewise depending upon length of employment.

The signing of the agreement marked the culmination of more than two years of negotiations, during which the union had filed charges before the National Labor Relations Board accusing the company of refusing to bargain collectively. These charges were filed in February, 1939. Last September, the union threatened to call a strike because of a jurisdictional dispute with Local 3 of the Electrical Workers Union, an A. F. of L. organization, which had sought to obtain some of the work done by the company's employes, particularly in the Park Chester housing project in the Bronx.

Last October, upon the request of the United Telephone Organizations, Dr. John R. Steelman, director of the United States Conciliation Service, intervened in the dispute between the union and the company, and the charges before the National Labor Relations Board were withdrawn without prejudice.

In the agreement which was signed July 15, the company obligated itself to resist any effort by labor organizations, whether they be members of the Building Trades Council or not, to encroach through jurisdictional claims upon work performed by the company's employes. It agreed that where no jurisdictional claims exist it would not let out by contract work that is not customarily so dealt with, in such a way as to cause lay-offs or part-timing of members of the United Telephone Organizations.

The United Telephone Organizations is affiliated with the National Federation of Telephone Workers, with a nation-wide membership of 150,000.

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Rate Increase Approved for Warren, Minn.

The Minnesota Railroad & Warehouse Commission on July 3 authorized the Warren Telephone Co. to change its schedule of rates upon the first billing date following July 31. The Warren company serves approximately 374 local and 191 rural sub-

scribers and performs switching services for 53 service stations.

Under present rates, operating revenues were $13,019, operating expenses $10,493, and taxes $895. The net income was $1,631, or 3.2 per cent on the $51,400 established as the fair value of the property.

Under the new approved rates operating revenues will amount to $15,206, operating expenses $11,069, taxes, $1,310. The net income will be $2,827, or a return of 5.5 per cent on the established fair value of the property.

The rates approved by the commission are: One-party business, $3.00; two-party business, $2.50; one-party residence, $1.75; two-party residence, $1.50; rural multi-party residence, grounded or metallic, $1.50, and rural switching service, $5.00 per year.

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Rate Increase Authorized for Improved Service

Construction of a new telephone building in Shelbina, Mo., to house a modern common battery system will start at once, it was announced July 7 by Western Light & Telephone Co. officials.

The announcement was made after the company had been notified the Missouri Public Service Commission had granted its petition for a telephone service rate increase at Shelbina with the stipulation that a new system be built.

The building, with system installed, probably will be ready about the first of the year. Until it is completed, the present service rates will remain in effect.

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Denial of Service to "Scratch Sheet" Approved

The Pennsylvania Public Utility Commission on July 8 dismissed a complaint filed by Abraham Plotnick against the Bell Telephone Co. of Pennsylvania, seeking to compel the company to install two telephones with necessary fixtures and appliances. The commission found that the complainant's business is the publication and distribution of a "scratch sheet" containing information about horse races.

The Pennsylvania Bell company had refused service on the ground that it does not want to give service where the business the applicant proposes to engage in is the publication and distribution of scratch sheets used by bookies and others as an aid to gambling on horse races.

Referring to the penal code enacted by the Pennsylvania legislature in 1939 which provided for the offenses of pool-selling and bookmaking, the commission said: ". . . Anyone who assists or abets in any manner the promotion of gambling on horse races violates the laws of this Commonwealth. The commission is the instrumentality created by the legislature to act as its agent in seeing to it that the public is furnished with adequate service at reasonable rates.

"In performing that duty the commission should determine whether or not providing telephone service to complainant is consistent with the laws of this Commonwealth. . . . Complainant's right to telephone service is not an inherent right. His right to receive service is dependent upon the fact of whether or not the use he desires to make of the service is consistent with the laws of this Commonwealth.

The record in this complaint leaves little doubt that the publication and distribution of 'scratch sheets' is definitely identified with book-making as outlawed in the penal code. . . . Thus the telephone facilities of the respondent company when furnished to complainant would aid, abet and provide the means whereby bookmakers and gamblers may be furnished information useful before making bets and necessary before paying off winners. . . .

The respondent company was justified in concluding that from the nature of the complainant's business the telephone facilities would be used or might be used in the furtherance of horse race betting which is contrary to law. By reason and law, respondent company was justified in its refusal to furnish the complainant telephone service in connection with the operation of complainant's business and the commission will not direct the respondent company to provide such telephone service."

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Car Owner Liable for Damages to Pole

In an action by the Ohio Postal Telegraph-Cable Co. to recover for damages caused when a negligently-driven automobile collided with one of its poles, the Ohio Court of Appeals in Licking county on April 8 reversed a lower court which had ruled in favor of the car owner. Final judgment in the amount of $91.46 with costs to be taxed in accordance with existing statutes, was entered in favor of the Postal company.

The court of appeals found that, under statute, public utilities are given the right to erect and maintain poles within highways, provided they shall

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Use of Wheatstone Bridge for Location of Cable Faults (Ctd.)

The more sensitive the galvanometer used, the more accurately can high resistances be measured. From a fault-location standpoint this limitation of the bridge on high resistances is not of consequence, for fault measurements are always in terms of relatively low-resistance values.

In discussing the basic features of the Wheatstone bridge, it has been stated that a bridge has separate A and B arms whose resistance ratio is adjustable. In most modern bridges the resistance ratio of arms A and B of the bridge can be changed by merely setting a rotary dial on the desired ratio, thus eliminating the necessity for separately setting the desired value in each arm.

These ratio dials are calibrated in terms of the ratio itself instead of the actual values of resistance in arms A and B. This simplifies the use of the bridge, for with the ratio dial it is only necessary to multiply the ratio dial setting by the resistance cut into the R arm in order to get the value of the resistance cut into the X arm. Fig. 5 illustrates the difference between the two types of bridges.

Operation of the Wheatstone Bridge for Straight Resistance Measurements

The operation of a Wheatstone bridge is a relatively simple process, provided a well-defined operation sequence is followed. Failure to proceed in an orderly manner increases the labor and increases the possibility of error in using the bridge. Damage to the galvanometer can also result from failure to operate the bridge properly. The following paragraphs describe the correct method of using a dial-type bridge. The same instructions also apply to bridges with separate A and B arms, except that the desired ratio must be obtained by setting up the proper values in A and B.

Step No. 1: Connect the resistance, which is to be measured, to the X arm terminals of the bridge. If the approximate value of the resistance to be measured is known, the ratio dial should be set according to the accompanying table.

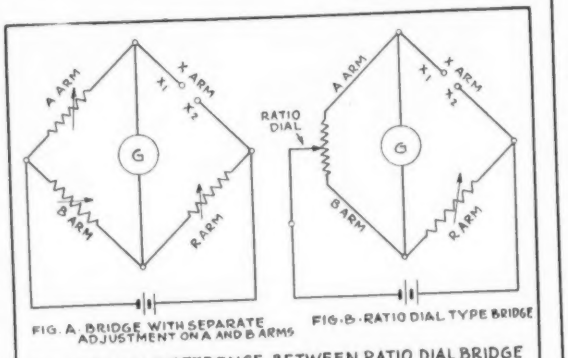

FIG. A. BRIDGE WITH SEPARATE ADJUSTMENT ON A AND B ARMS

FIG. B. RATIO DIAL TYPE BRIDGE

FIG. 5. BASIC DIFFERENCE BETWEEN RATIO DIAL BRIDGE AND ONE WITH SEPARATE A AND B ARM ADJUSTMENT

Step No. 2: With the ratio dial set on the correct value, close the battery key and then the galvanometer key. The galvanometer key should be depressed only momentarily and the direction of deflection of the galvanometer pointer noted. Most galvanometers have a "plus" and "minus" marking on each side of the scale. If the needle deflects to the plus side, it means that a greater amount of resistance must be cut into the R arm of the bridge to balance the unknown resistance. If the needle deflects to the minus side of the galvanometer, it means that the resistance must be cut out of the R arm to balance the bridge.

Unknown Resistance	Ratio Dial Setting
Below 10 ohms	0.001
10 ohms to 100	0.01
100 ohms to 1,000	0.10
1,000 ohms to 10,000	1.00
10,000 to 100,000 ohms	10.00
100,000 to 1,000,000 ohms	100.00
1,000,000 to 10,000,000 ohms	1,000.00

CORRECT RATIO DIAL SETTING FOR VARIOUS RESISTANCE VALUES

If the bridge is considerably off balance when the galvanometer key is depressed, a substantial current will flow with resultant violent deflection of the needle. To avoid mechanical damage to the needle or moving coil, the key should be depressed only momentarily when first bringing the bridge into balance.

Some bridges are equipped with one or more galvanometer shunting keys. These keys by-pass some of the current around the galvanometer when they are depressed. They should be held in the operated position when making the initial adjustments to balance the bridge.

An orderly procedure should be followed in adjusting the R arm to balance the bridge. Start with all of the rheostat dials set on zero. Next adjust the 1,000 dial until the unknown resistance is located between two points on this dial. Set the dial on the lower reading; then proceed to the 100 dial and locate the correct setting on the dial. Next take the 10 dial and finally the unit dials should be handled in the same way.

Step No. 3: After the bridge has been balanced as shown by zero deflection of the galvanometer, the value of the unknown resistance is easily determined by merely multiplying the ratio dial setting by the value of the resistance cut into the R arm; that is: $X = AR$, where X = value unknown resistance; A = ratio dial setting; and R = rheostat dial setting.

For bridges having separate A and B ratio arms, the unknown resistance is found by the following simple equation:

$$X = \frac{AR}{B}$$

The Wheatstone bridge as previously stated is peculiarly adapted to the measurement of faults of all types in open-wire or cable circuits. Its outstanding advantage as a fault-measuring instrument is the fact that the accuracy of measurements made are more or less independent of the resistance of the fault itself, whereas with ordinary ohmmeters the resistance of the fault appears in series with the circuit under measurement, thereby resulting in inaccurate results.

not discommode the public in the use thereof; but where a pole is not upon or near the improved portion of the highway and is not, in foreseeable probability, an instrumentality liable to injure a traveler, a motorist who negligently misuses the highway and injures such pole is liable for the damages he causes.

Under the statutory provisions that poles shall not discommode the highway users, the court stated that the traveling public has superior right only in the improved portion of the highway and the portion in close proximity thereto.

"We believe the law is, and should be," declared the court, "as found succinctly stated in the annotation found in 82 A. L. R. 395, which we quote and adopt:

It may be stated as a general proposition that a company lawfully maintaining poles in or near a public highway is not liable for the damage to person or property resulting from a road vehicle striking such pole, unless it is erected on the traveled portion of the highway or in such close proximity thereto as to constitute an obstruction dangerous to anyone properly using the highway, and the location of the pole is the proximate cause of the collision.

"It is a poor rule which fails to work both ways. When the plaintiff is found to be lawfully using the highway, and its pole is not upon or in close proximity to the portion thereof improved and set aside for vehicular travel, and in all common foreseeable probability not an instrumentality liable to injure a traveler, and when, on the other hand, we find a motorist who admits his negligence, or is proven to have been negligent, and who misuses the highway and invades that portion thereof reserved for other lawful purposes, and who by his own carelessness injures the property of another, is, and should be, liable for the damage which he does to such property which is lawfully upon the highway."

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Summary of Commission Rulings and Hearings

Federal Communications Commission

July 5: Southwestern Associated Telephone Co. granted authority to acquire by purchase all the properties of the Haskell (Texas) Telephone Co., subject to the provision that "neither the issuance of this certificate nor anything contained herein shall be construed as an approval of the commission of the accounting to be performed in connection with the transaction."

July 5: The American Telephone & Telegraph Co. granted authority to acquire the property and assets of the American Telephone & Telegraph Co. of Massachusetts. As of December 31, 1939, the property value appeared on the balance sheets at approximately $6,222,911.

Illinois Commerce Commission

July 16: The commission requested the attorney general to take action to enforce its order of June 11 against the Chesterfield-Medora Telephone Co. to render satisfactory service to subscribers in its Rockbridge exchange. The company, it was announced, failed on July 1 to submit a report showing service was satisfactory.

July 16: Commission approved a contract under which the Worden Telephone Co. will purchase from Shelby J. Kilingel, for $2,500 all telephone properties of the Worden Telephone Exchange at Worden.

July 23: Hearings in Chicago on application of Joseph B. Garber for an order requiring the Minonk Telephone Co. to no longer interfere with petitioner relative to telephone service, and that the Flanagan Mutual Telephone Co. be ordered to accept petitioner as a subscriber for telephone service out of Flanagan.

Indiana Public Service Commission

July 18: The Citizens Telephone Co. of Decatur given authority to operate in Bryant, in Jay county. The company's petition for authority was accompanied by signatures of telephone users in Bryant who declared the present service of the People's Telephone Co. there is inadequate.

Kansas Corporation Commission

July 29: Hearing on application of Western Light & Telephone Co. for authority to make certain changes in the rates in Argonia and vicinity.

July 30: Hearing on application of Western Light & Telephone Co. for authority to make certain changes in rates in Norwich and vicinity.

August 5: Hearing on application of American Telephone Co. for permission to file a new schedule of rates at its Holton exchange.

August 13: Hearing on complaint against Southwestern Bell Telephone

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Michigan Public Service Commission

July 26: Hearing in Lansing on application of Michigan Bell Telephone Co. for authority to purchase lines of the Weneeda Telephone Co.

July 26: Hearing in Lansing on application of Michigan Bell Telephone Co. for authority to enlarge its Lansing base-rate area.

July 26: Hearing in Lansing on application of Michigan Bell Telephone Co. for authority to purchase the Elmdale Mutual Telephone Co.

Missouri Public Service Commission

July 31: Hearing on application of United Telephone Co. for authority to file schedule of rates for common battery service in Hermann.

July 31: Hearing on application of P. Kerr Higgins, operating as Fidelity Telephone Exchanges, for authority to file schedule of rates for telephone service in Owensville.

New York Public Service Commission

July 17: Commission denied a petition of the Ogden Telephone Co. of Spencerport for authority to transfer its plant and franchises to the Rochester Telephone Corp. The commission ruled that the cash consideration of $35,174 agreed upon is $14,685 in excess of a price based on original cost of the property and that a transfer on such a basis would not be in the public interest.

Ohio Public Utilities Commission

July 16: Secretary John R. Jones filed his certification with the commission on the application of the Ohio Bell Telephone Co. to revise rates in its Lisbon exchange upon conversion to dial service, the proposed rates being as follows:

Business independent, $4.00, no change; business two-party, $3.25, no change; business rural, $2.50 to $3.00; residence independent, $2.50 to $2.75; residence four-party, $2.00, no change; residential rural, $2.00, no change.

Thirty days will elapse before the commission sets the date for a hearing on the application.

July 29: Hearing to be held on application of the Ohio Bell Telephone Co. for permission to erect a new telephone exchange building in Chagrin Falls.

Tennessee Railroad & Public Utilities Commission

June 28: Permission to build a line to Millington to serve the new powder plant there granted to the Southern Bell Telephone & Telegraph Co. When completed, the line will be 13½ miles from the company's system at Memphis, but will be connected with that exchange.

The Millington Telephone Co., an Independent, agreed to construction of the line because its facilities are inadequate to serve the powder company, commission officials said.

Wisconsin Public Service Commission

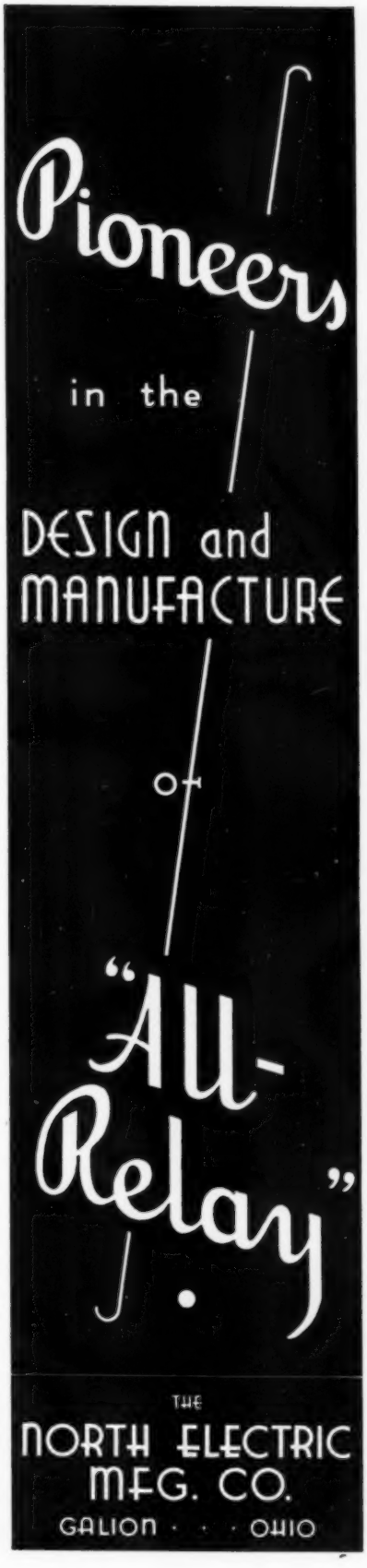
July 23: Hearing held in Madison in state-wide investigation on the commission's own motion of the rates, rules, services, practices and activities of the Wisconsin Telephone Co.

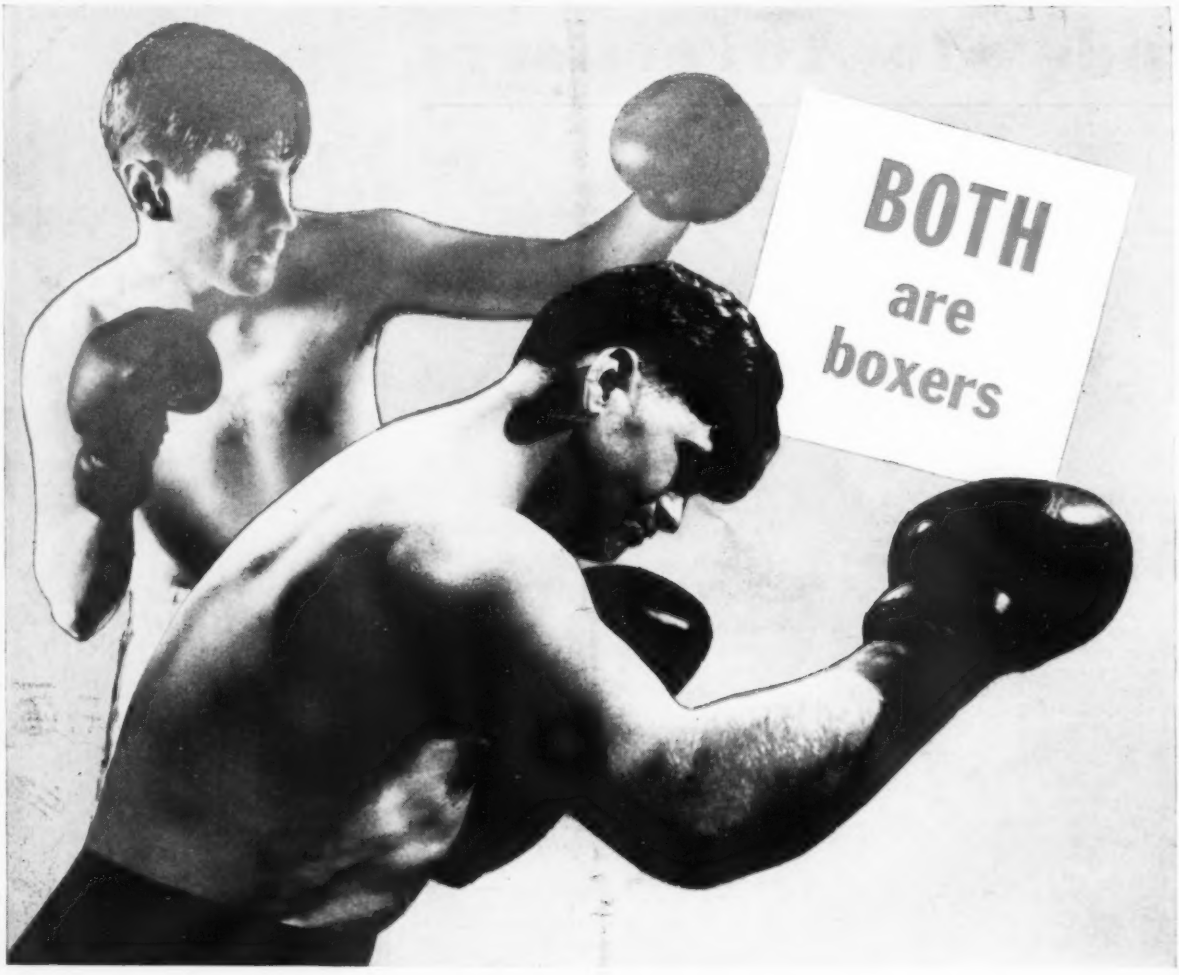
July 23: Hearing held in Madison on complaint of Louis Podell against Wisconsin Telephone Co.

XUM

Index to Advertisers

	Page
Acme Visible Records, Inc.	—
American Appraisal Co., The	33
American Automatic Electric Sales Co.	18-19-23
American Creosoting Co.	—
American Fork & Hoe Co., The	—
American Steel & Wire Co.	21
American Telephone & Telegraph Company	—
Anaconda Wire & Cable Co.	—
Armstrong Cork Co., Whitall Tatum Glass Insulators Dept.	—
Automatic Electric Co.	18-19-23
Automatic Telephone & Electric Co., Ltd.	—
Babcock Garrison	33
Bartlett Mfg. Co.	—
Berry & Co., L. M.	—
Brach Mfg. Co., L. S.	—
British Insulated Cables, Ltd.	—
Buckeye Telephone & Supply Co.	34
Calculagraph Company	—
Carney & Co., B. J.	33
Chance Company	—
Christiansen Co., C. M.	33
Churchill Cabinet Co.	—
Clark, Frank M.	34
Coffey System & Audit Co.	33
Coffing Hoist Co.	—
Columbia Steel Co.	21
Cook Electric Co.	30
Cook's Sons, Inc., Adam	—
Cope, Inc., T. J.	—
Copperweld Steel Co.	—
Cuneo Press, Inc., The	—
Davey Tree Expert Co.	—
Donnelley & Sons, R. R.	28
Electric Storage Battery Co.	6
Everstick Anchor Co.	—
Fansteel Metallurgical Corp.	—
Fibre Conduit Co.	21
Forged Steel Products Co.	—
Fort Wayne Printing Co.	—
Fowle, Frank F.	33
General Cable Corp.	7
General Electric Co.	—
Goshen Mfg. Co., The	—
Gould Storage Battery Co.	—
Graybar Electric Co.	—
Gray Manufacturing Co., The	27
Harter Corporation, The	—
Herdrich & Boggs	33
Highway Trailer Co.	—
Holtzer-Cabot Electric Co.	—
Indiana Steel & Wire Co.	—
International Creosoting & Construction Co.	33
International Harvester Co.	—
Joslyn Mfg. & Supply Co.	—
Kearney Corp., James R.	29
Kellogg Switchboard & Supply Co.	4-5
Kennecott Wire & Cable Co. (subsidiary of Kennecott Copper Corp.)	—
Kester Solder Corp.	—
Klein & Sons, Mathias	—
Leich Sales Corporation	2
Lenz Electric Mfg. Co.	—
Line Material Co.	—
Loomis Advertising Co.	—
Lorain Products Corporation	28
MacGillis & Gibbs Co.	33
Matthews Corp., W. N.	—
Michigan Pole & Tie Co.	—
National Carbon Co., Inc.	36
National Fireproofing Corp.	30
National Construction & Engineering Co.	—
National Telephone Supply Co.	8
North Electric Mfg. Co., The	35
Owens-Illinois Glass Co., Hemingray Division	—
Paine Company	—
Paragon Electric Co.	—
Partridge Lumber Co.	33
Philco (Battery Division)	8
Phillips Electric Works, Inc.	—
Porcelain Products, Inc.	—
Porter, Inc., H. K.	—
Premax Sales Division, Chisholm Ryder Co., Inc.	—
Raytheon Mfg. Co.	—
Ray-O-Vac Company	31
Rebuilt Electric Equipment Co.	—
Reliable Electric Co.	25
Remington Rand, Inc.	—
Roebling's Sons Co., John A.	—
Schauer Machine Co.	—
Seymour Smith & Sons, Inc.	—
Shallcross Mfg. Co.	—
Sloan & Cook	33
Sparta Manufacturing Co.	33
Stewart Brothers	34
Stromberg-Carlson Telephone Mfg. Co.	3
Sturgis Posture Chair Co.	—
Suttle Equipment Co.	—
Telephone Repair Co.	—
Telkor, Inc.	—
Union Carbide & Carbon Corp.	36
United States Steel Corp.	21
Utica Drop Forge & Tool Corp.	—
Utilities Service Co.	—
Valentine Clark Corporation	33
Wagner-Malleable Products Co.	—
Western Electric Co.	—
Weston Electrical Instrument Corp.	—
White, Weld & Company	—
Wood Preserving Corp., The, a Koppers subsidiary	—
Wopat, J. W.	33
Wray & Co., J. G.	33





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